CONSUMER INSTALMENT SALES CREDIT IN THE UNITED STATES ECONOMY AND ITS RELATIONSHIP TO MONETARY POLICY, 1946-1963

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PREFACE

This dissertation is a study of the economic theory of consumer instalment sales credit and the relevant empirical data of the 1946-1963 period. The complete results of the multiple regression analyses of the empirical data are contained in the Appendix. Summary tables of the results are incorporated in the later chapters of the study, however, and are used as a basis for relating the empirical data to the theoretical view of the early chapters.

The facilities and funds for the statistical analyses in the final phase of the study were provided by Dr. Carter C. Osterbind as Director of the Bureau of Economic and Business Research, and for the aid and advice generously rendered by him and his staff, I am indeed grateful. In particular, Mr. Dale L. Moody has been extremely helpful, especially in connection with computer programming and operations. I also wish to express my appreciation for the cooperation received from the Computing Center in this area.

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INTRODUCTION

This is a study of the role which consumer instalment sales credit has attained in the total complex of the U.S. economy. The general area of concern obviously is that of consumer loans, but the categorizing of consumer loans is often conventional and not altogether logical. In this study the category is defined in a manner that might not be suitable for other approaches. The area under consideration will be those obligations, payable in instalments, which have been incurred as a result of the demand for and the purchase of consumers' durables. Personal loans, although payable in instalments, will not, therefore, be included. Repair and modernization loans, while having some common characteristics with those for durable goods, do not have enough similarity from the standpoint of demand to warrant inclusion. And, of course, real estate credit stands one giant step beyond because of its long-term characteristics. This is not to say that interrelations do not exist among these areas of consumer finance. In fact, it is an objective of this study to determine the relationships between consumer instalment sales credit and other elements of the economy, particularly those financial factors with which consumers are concerned, in order to determine its role in the economy and evaluate the relationship between instalment sales credit and cyclical fluctuations.

The total expenditure on consumers' durable goods is made up of two components; consumer instalment sales credit is one component, the other is cash. Although all expenditures on consumers' durable goods provide a basic unstable element in the economy because of the inherent postponable and substitutable nature of these "consumer capital" purchases, financing them with instalment credit provides an avenue for even greater instability. Purchase decisions may be even more rapidly implemented when a large portion of the payment is made by obligating future income, and future purchases may be subject to longer postponement if income is reduced and the budget is still bearing the burden of monthly instalment payments dating from a more prosperous period.

The contribution of consumer instalment sales credit to fluctuations in economic activity is the source of some conflict between two diverse viewpoints. On one side there are those who use a Keynesian analysis to argue that an increasing volume of consumer instalment sales credit has an accelerating effect on the expansion of effective demand far out of proportion to its own relative size and that a subsequent retardation in consumer instalment extensions will cause a more rapid acceleration in the contraction phase of the cycle.[1] The results, respectively, would be a higher peak to a boom and a deeper recession. On the other hand, some writers, while not refuting the Keynesian analysis, feel that, although consumer instalment credit's influence on cyclical fluctuations merits careful study, its possible destabilizing effect is not so significant as to overshadow all its desirable aspects.[1] They argue that the cyclical behavior is questionable and cannot be isolated from other elements. An object of this study is to test the role of consumer instalment sales credit by determining the significance of its relationship to other elements of the economy.

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[1] In particular, Rolf Nugent in Consumer Credit and Economic Stability (New York: Russell Sage Foundation, 1939), later given qualified confirmation by Gottfried Haberler in Consumer Instalment Credit and Economic Fluctuations (New York: National Bureau of Economic Research, 1942).

The first part of the study will review the development of consumer instalment sales credit and the theories of its application to our economy. These theories will be analyzed and evaluated to discover their weaknesses and strong points. Next, the demand for consumer instalment sales credit will be examined. The variables which enter into the consumer decision to make a durable goods expenditure will be developed here by analyzing the views of Ruby Turner Norris, James S. Duesenberry, and George Katona in particular, along with the supporting and dissenting concepts of other authorities concerned with the study of consumer demand. The subsequent step in the development of the thesis is the incorporation of consumers' psychological and financial factors which mold the decision regarding the purchase of durables into an aggregate demand for consumer instalment sales credit.

In the following chapter the supply of consumer instalment sales credit will be explored by considering the various suppliers and the availability of their funds from bank and nonbank sources. A final view of the quantitative elements in the supply picture will consider the effect of monetary policy on these sources as an indication of the control which exists at present over this area of credit extension. Another aspect of the institutional framework of the supply of consumer instalment sales credit will be presented in Chapter IV from the standpoint of nonprice competition, as proposed by Theodore O. Yntema.

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[1] See Reavis Cox, The Economics of Instalment Buying (New York: The Ronald Press Co., 1948).

From this analysis and evaluation an integrated view of the supply and demand factors which form a basis for the volume of consumer instalment sales credit will be drawn. The earlier work of Avram Kisselgoff in this field provides a point of departure for developing the total relationship. The next step will be to examine it empirically. This will be accomplished by applying multiple regression techniques to data of the postwar period pertaining to the automotive sector, one which lends itself well to empirical study.[1] Because of the magnitude of the automotive sector in the economy and its large share of the volume of consumer instalment sales credit, the analysis of the of the results of these regressions can appropriately be applied to the total consumers' durables sector.

Ranging from companies whose operation is directly related to, or an integral part of, the production of automobile sales to the suppliers of such basic items as glass, rubber, steel, plastic compounds, nickel, and lead, the automotive industry has an immediate impact on overall business activity which is unique and possibly second to none in quantitative importance. Its secondary effects on such economic areas as the petroleum industry, highway construction, and tourist services add to the formidable picture of an industry which purchases 21 per cent of all steel sold in the United States, employs one out of every seven wage earners, and is comprised of approximately 17 per cent of all business organizations in the United States. Seventy-seven per cent of all spending units in the United States (or 80 per cent of all families) own automobiles. On December 31, 1963, there were an estimated 68 million passenger cars registered in the country. The fact that special motor vehicle taxes totalled approximately $12 billion in 1963 provides an indication of the effect of this industry on governmental operations.[1] The impact of automobile sales finance[2] is correspondingly large by comparison, since the amount outstanding has steadily risen from 53 per cent of all sales finance at the end of 1940 to 62 per cent at the end of 1963.

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[1] All of these data for which the U.S. Board of Governors of the Federal Reserve System is the source are those most recently available from their Division of Research and Statistics. The Federal Reserve Bulletin provides many through its "Financial and Business Statistics" section. The Bulletin also contains tables of revised series from time to time. A number of pamphlets have been published by the Board in the past few years, each of which is a section of their Supplement to Banking and Monetary Statistics. These contain many of their regular series but some of the data therein may not be available in other publications. Consumer Credit Statistics, February 1963, is one of these sections used extensively in this study, as is Member Bank Reserves and Related Items (Section 10), January 1962.

The position of the automobile in the American economy embodies many unusual characteristics. Witness the classic picture of the Cadillac parked in front of the owner's slum dwelling. With the fine technical developments pari passu have come style changes and additions such as tail fins, oversize hub caps, and excessive quantities of glass and chrome, which are more of a detriment than an addition, especially from standpoints of safety and aesthetic qualities. These characteristics do not set the automotive industry and the automobile aside from other consumers' durables, however. In television sets, washing machines, motor boats, and vacuum cleaners, all the characteristics of postponability are present, as well as the manifestations of "conspicuous consumption." Color television sets now carry the symbol of prestige for their owner by displaying a distinctive antenna on his roof top. New models of washing machines are brought out each year so that the style-conscious housewife who desires all the latest chrome and technical advances will replace her present, still serviceable, model with the newest design. The emotional relationship between the owner of a motor boat and this vehicle may even exceed that which he feels for his car, but of course, there are less motor boat owners by far than car owners. Thus, we see that in viewing the automotive industry sector we can study a composite of the demand for consumers' durables and consumer instalment sales credit on a much larger scale than would be present in any other category of consumers' durables. Significant relationships revealed between extensions of instalment credit and other elements of the economy in the automotive area should hold for other consumers' durables.

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[1] Automobile Manufacturers' Association, Automobile Facts and Figures, 1964 edition.

[2] The term sales finance will be used in this dissertation to convey the same general meaning as consumer instalment sales credit.

The final chapters analyze the regressions and develop the conclusions which can now be presented regarding the impact of this growing sector of the economy, considering the problem of control in the light of the conclusions reached. It is felt that this survey, analysis and re-evaluation of existing literature can be productively attempted now in an economy which has undergone extensive change in structure, particularly in the field of consumers' durables; and, that by testing relevant data, a more encompassing and appropriate theory can be demonstrated. Prediction for more than a short time into the future is an almost futile task. Our most constructive efforts are those directed toward advancing economic thought to present day levels of the economy's operation, and the goal of this dissertation is to accomplish some measure of success in doing so with consumer instalment sales credit theory.

CHAPTER I

THE INSTITUTION OF CONSUMER INSTALMENT SALES CREDIT AND ITS RELATIONSHIP TO CYCLICAL FLUCTUATIONS

Payment for the use of another's funds to finance personal expenditures can be documented in records of the ancient as well as the medieval world. Money lending was generally viewed with disfavor, but since most loan requirements were for consumption purposes due to personal misfortunes or emergencies, it was allowed, subject to the restrictions of religious or ethical standards of the society. Loans to finance overseas commerce were also countenanced, and the surrounding facts seen to indicate some recognition in that day of the distinction between productive and consumptive credit.

In the middle ages efforts continued to suppress the taking of interest, while those in need of funds and those with money to lend looked for means of circumventing the restrictions. The church allowed certain exceptions for actual losses which the lender sustained as a result of not having the use of his money (damnum emergens). Eventually, exceptions were made to provide payment for the theoretical profits he might have made (lucrum cessans). The disfavor with which loans for consumption purposes have been and sometimes still are viewed thus has its origins in antiquity, but we have adapted our thinking to newer economic concepts or become sufficiently well versed in rationalization to almost completely overcome this legacy.

Just when the first retail salesman said to a hesitant customer, "Buy now and pay later," is not known,[1] but it is sufficient for the purposes of this study to realize that the distinction between producer and consumer credit became completely clear when production was removed from the household by the industrial revolution, and the factory system took over that large segment of our economy.[2] Instalment buying and selling, known variously and sometimes inaccurately as, "deferred payments," "time sales," "easy payments," and "instalment plan" in the United States; and as "hire-purchase" or the more picturesque "never-never" in England, has developed in the United States from roots that extend back over more than a century. By 1800 in the United States several types of consumer credit-granting could be recognized. The first was the merchant; the second, the physician; the third, the pawnbroker.[3] It is the first of these to which we will turn our attention in this study.

Although credit at this time was primarily mercantile and in any event was not granted indiscriminately, the rapid expansion of the American economy forced the use of retail credit to absorb the resulting production and especially to facilitate the purchase of relatively high-priced merchandise. The credit instrument was usually a promissory note in the amount of the balance remaining after a downpayment.

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[1] See Charles O. Hardy (ed.), Consumer Credit and Its Uses (New York: Prentice-Hall, 1948), chap. i, for further description of the evolution of consumer instalment credit.

[2] Nugent, p. 42.

[3] Nugent, p. 43.

The note would be payable at a specified time, usually in sixty or ninety days. In rural areas this practice persisted longer than in the cities, and the time ran from four to eight months in the 1860's on hardware items, presumably for settlement after harvest.

The use of open-book credit was also greatly in evidence in the early part of the nineteenth century. Wage earners were required to settle after each payday; business and professional people made monthly settlements; while farmers were usually financed from one crop to another. In rural areas in general, open-book credit of a year's duration was found to be necessary and feasible.

Consumer instalment sales credit also appeared about the same time. One definition of this institution stipulates first, that it is credit used for consumption purposes; second, that the payments are in regular amounts on a prearranged schedule; third, a financing charge is made; fourth, it is short or intermediate in nature; and fifth, it is attested by a negotiable instrument providing for legal action in case of default on repayment.[1] In another statement the system is defined as a transfer of wealth, the payment for which is deferred in whole or in part to the future.[2] The early differentiation between instalment and open-book credit, was that the former is granted specifically in conjunction with a single purchase, usually of a consumers' durable, but the initial amount of credit was much larger. Payments were individually smaller since the repayment was spread over a longer period. Lastly, a partial cash payment was usually required at the time the purchase was made.[1]

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[1] Haberler, p. 18.

[2] Edwin R. A. Seligman, The Economics of Instalment Selling (New York: Harper & Brothers, 1927), I, 2.

We may, therefore, sum the elements of consumer instalment sales credit as follows:

1. A transfer of wealth is involved, i.e., a sale.
2. Payment for the merchandise is deferred in whole or in part to the future, i.e., credit is granted.
3. The credit is used for consumption purposes, primarily for consumers' durables.
4. The credit is granted specifically in connection with a single purchase.
5. A partial cash downpayment is usually required at the time of the transaction.
6. The balance is payable in regularly prescheduled units, usually of equal amount, under a plan agreed upon at the time of purchase.
7. The arrangement includes a charge for the financing service rendered (including interest at a rate appropriate to the risk involved and the current market rate).
8. The period of repayment is short or intermediate term.
9. The debt is attested by a negotiable instrument providing for legal action in case of default.

Some further qualifying observations should be made. At times transactions considered to be in the category of consumer instalment credit may be put to use partially or wholly for business purposes. An automobile, for example, may be used by a salesman in the conduct of his business and also for family pleasure. Secondly, although open-book accounts are not included in the instalment credit classification, it should be noted that present-day, so-called, revolving charge accounts are a compromise arrangement embodying characteristics of both open-book and instalment credit. The period of time for repayment of instalment credit is longer than that usually allowed for the settlement of open-book accounts, however. On the other hand, residential mortgages are not included in the definition because their time element is far beyond that of instalment credit. A final comment on these elements of consumer instalment credit should be made in regard to point 6 above. So-called "balloon notes" are an exception to the usual situation, since the last payment is purposely made considerably larger than the others.

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[1] Nugent, p. 54.

Early Instalment Sales

Consumer instalment sales credit in the United States appears to have originated with the New York furniture house of Cowperthwaite and Sons in 1807. The use soon spread to other similar businesses and to other large cities. About 1850 the Singer Sewing Machine Company entered the field of instalment credit and was followed shortly thereafter by its competitors. Since this type of business, in contrast to that of the furniture houses, was carried on largely by itinerant agents, the spread of the idea of instalment selling from one community to another was fostered by their resulting geographical and financial progress.[1] Thus far all the entrants in the field were considered to be in the "high-grade" category, as was the next to be observed, the piano retailers. By 1870, pianos, melodians, and organs were being sold on terms of a small downpayment and the balance in monthly instalments. The final category of the early high-grade instalment business was that of the book sellers. Although this merchandise did not have all the durable characteristics of the other high-grade products, encyclopedias and book sets were sold on instalments as early as 1871. The title "high-grade" refers essentially to the fact that the merchandise was good quality and of high utility to the purchaser. Credit was extended to him as a service and did not always influence his decision to buy. He usually had an established reputation which indicated that he was a good credit risk. In the late 1870's, furniture houses also began to sell all types of household equipment on instalments. The poorer quality merchandise offered through this medium plus the sale of clothing and cheap watches and jewelry which started in the early 1880's introduced the era of the low-grade instalment business which followed.

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[1] Nugent, p. 67.

Low-grade Instalment Credit

During the latter part of the nineteenth century the use of instalment credit was extended to the lower-income classes, who were generally poorer credit risks. At the same time the quality of merchandise offered, especially to these new customers, was reduced (at inflated prices) to the extent that much of it fell into the category of the so-called "fake" instalment business.[1] Non-English-speaking immigrants in the north and middle west and colored laborers in the south were predominantly the victims of the artful salesman. They were induced to sign contracts to buy such things as watches, jewelry, and fancy gewgaws at many times their true value, and collections were enforced by legal and, when thought expedient, illegal methods.

Seligman writing in 1927 says, "although the old 'fake' instalment business as such has largely disappeared, there still remain practices in the instalment business in the city of New York which are closely analogous."[2] These low-grade or "borax merchandise" dealers, although a small percentage of the total instalment business, brought some measure of disrepute upon the whole field of instalment selling.[3] This has affected its development even to the present. The "full-disclosure" legislation still pending in congress is evidence of the present concern with the terms of the contract, where abuses may still exist. The quality of the product available to the credit purchaser is no longer primarily of the low-grade type, however, and in that regard he suffers no disadvantage in comparison to the cash customer.

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[1] Seligman, I, 20, citing Henry R. Mussey, The "Fake" Instalment Business (New York: University Settlement Society, 1903).

[2] Seligman, I, 21.

[3] See also, Nugent, p. 72.

Economic Theory and Consumer Instalment Sales Credit

The rapid growth of consumer instalment sales credit and the realization of its economic significance began to attract more attention from economic writers around the middle of the 1920's. Until that time only a paragraph or two at the most was ever devoted to it in economic writings.

Generally, assuming the classical position of full employment, it was argued under Say's law that an expansion of consumer credit could expand the production of consumer goods only at the expense of the producers' goods industries, and a contraction of consumer credit would result only in a shift of productive factors back to the producers'goods industries. Under nineteenth century conditions of growing demand in an economy working close to its present capacity these assumptions offered reasonable bases for a first approximation of the situation. The resulting conclusion of the exponents of the aforesaid doctrine was that the expansion of consumer credit would influence the growth of the economy adversely, in the long run, by retarding the movement of capital into production.

The contention of some that consumer credit has filled the gap between production and purchasing power, represented an attack on Say's law, but the attack on the classical position was not pursued to disclose its fundamental weakness. It was contended that to maintain the equilibrium between production and consumption necessitated an increasing rate of expansion of consumer credit. Such an expansion, it was felt could not continue indefinitely and a depression would result.[1] It was predicted that the credit capacity of the public would eventually become saturated, and total purchasing power would diminish, leaving the artificially expanded productive capacity of affected industries unused.[2] Mill had stated that:

> Credit given by dealers to unproductive consumers is never an addition, but always a determent, to the sources of public wealth. It makes over in temporary use, not the capital of the unproductive classes to the productive, but that of the productive to the unproductive.[3]

A more recent observation does not completely refute Mill's view, but merely questions some of his underlying assumptions as not being appropriate to the economy of this century.[4] Essentially it is felt that consumer instalment sales credit can contribute to increased production as a result of the labor-saving characteristics of the durable goods, and generally that expansion of consumer credit does not necessarily detract from the accumulation of productive resources.

Another view refutes the contention that the labor-saving features of durable consumer goods allow any large amount of consumers' labor to be added to the exchange system, contending that the bulk of the energy so released results in increased leisure rather than in more labor entering the exchange system.[1] The legitimacy of the claim of increased production, however, may be seen clearly today in the shift from the use of commercial laundries' services, especially by the middle income group, since automatic washers and dryers have taken the drudgery out of home laundry. Many housewives who would not use a scrubbing board or even a wringer washer, because of the menial nature of the task, do not mind expending the necessary additional effort to do their own laundry with automatic equipment, instead of sending it out. Thus additional labor, formerly leisure, has been added to the system replacing the labor of the laundry worker which is then available to be applied elsewhere. The same reasoning may be seen to apply to other similarly affected industries, such as bakeries, and public transportation, as well as to the use of domestics in the home. And, where increased leisure has resulted, more labor has been employed by industry and service operations connected with leisure-time activities.

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[1] William T. Foster, "The Basic Meaning of the Growth of Instalment Selling," Proceedings of the Academy of Political Science, XII, No. 2 (January, 1927), 112-118.

[2] "Where Instalment Buying Breaks," The New Republic, April 7, 1926, p. 186.

[3] John Stuart Mill, Principles of Political Economy (Fifth ed.; London: Parker, Son, and Bourn, 1862), II, 38-39.

[4] Wilbur C. Plummer, "Social and Economic Consequences of Buying on the Instalment Plan," The Annals of the American Academy of Political and Social Science, Supplement to CXXIX (January, 1927), pp. 14-16.

Only because the family has the opportunity to purchase vacuum cleaners, waxers, cake mixers, and automobiles, as well as automatic washers and dryers, by means of consumer instalment credit--and at an early stage in its life cycle--is it possible for the additional labor to be fully utilized. Without consumer instalment sales credit this additional labor would be lost to the family and the economy, not only during the period of instalment payments (assuming the family would save voluntarily as much as the principal repayment each pay period) but, if they maintained their standard of living in the meantime, for an even longer period. They would continue to send out laundry, buy bakery goods to a greater extent, have a cleaning woman in more often, and use public transportation more extensively than if they owned the durables. Since the excess costs of these services would be deducted from the savings toward the purchase of the durable goods, the period would be prolonged and the goal often not achieved completely. This point deserves no further attention at this time, but it will be revisited in Chapter II as part of the discussion of demand for consumer instalment sales credit.

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[1] Wallace P. Mors, Consumer Credit Theories; An Historical and Critical Analysis (Chicago: University of Chicago Press, 1944), p. 47.

In contrast to those who saw the stimulating effects of this credit in an expansion merely offset by the depressing effects in a contraction,[1] others espoused the view that the increase in purchasing power afforded by consumer instalment sales credit causes a rise in production which augments future consumer income and purchasing power so that the additional income generated is at least equal to the amount of the obligation. Although the finance charges represent an additional cost to the instalment purchasers, they are payment for services and also become part of the national income.[1] Those taking this position, while denying the classical assumptions, had not thought the problem through, for they apparently did not contemplate the possibility that the process of increasing production and purchasing power as the result of the credit expansion might be reversed by its contraction.[2] Some observed cautiously that consumer instalment sales credit may be seen to lend aid to effective demand for goods of a growing industry and thus increase production and purchasing power in a spotty manner.[3] The lack of conclusiveness in dissenting from the classical position may be attributed to the lack of definitiveness in dynamic economic theory of that period. Until the acceptance of the condition that an equilibrium position of incomplete utilization of the factors of production might exist, as developed by Keynes,[4] the deviations from classical theory, recognized by many, remain unresolved.

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[1] N. R. Danielian, "The Theory of Consumer Credit," American Economic Review, XIX, No. 3 (September, 1929), 410. Also Joseph E. Shafer, "An Explanation of the Business Cycle," American Economic Review, XVIII, No. 4 (December, 1928), 628. Also Charles E. Persons, "Credit Expansion, 1920 to 1929, and Its Lessons," Quarterly Journal of Economics, XLV (November, 1930), 129-130.

The Theory of Nugent and Haberler

Nugent's work, coming close on the heels of the *General Theory*, uses an almost completely Keynesian analysis to show the effect of consumer instalment sales credit fluctuations on the economy. He is concerned, however, that a use of the "saving equals investment" keystone of Keynes' theory may be misconstrued, and so he employs the term "investment" in the popular sense to refer to intentional expenditures which result in capital formation, and "savings" to refer to intentional savings by income recipients.[1] Having confined his concept of saving to "depressing withdrawals" and investment to "stimulating outlays," he thus is able to say that the differences between saving and investment result in changes in income and to sidestep the "ex post"--"ex ante" issue.

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[1] Alvin Johnson, "No Danger in Instalment Buying," *The New Republic*, April 28, 1926, pp. 305-306. Also Seligman, I, 279-283.

[2] Nugent, p. 169.

[3] John M. Clark, "Control of Trade Practices by Competitive and Other Forces," *Proceedings of the Academy of Political Science*, XII, No. 2 (January, 1927), 106-107.

[4] John Maynard Keynes, *General Theory of Employment, Interest, and Money* (New York: Harcourt, Brace and Co., 1936).

If, under this definition, investment exceeds savings, a primary addition to the income stream equal to the difference between the two immediately takes place, providing idle balances are available for the additional expenditures. Although prices will tend to rise, the rise will be limited by the existence of idle productive factors.[2] The enhanced profit picture, together with declining inventories, will induce entrepreneurs to increase output and employment. Thereupon a secondary effect will be set in motion, since increased effective demand will result from that portion of the incremental income which is consumed. The total of all such successive increments is, of course, the multiplier effect, and its extent accordingly is based on the marginal propensity to consume.

In Nugent's terminology the secondary effect is the multiplier minus one (the primary effect) times the excess of investment over saving--less leakages--or (K-1)(I-S). Since $K = \frac{1}{1-M.P.C.}$, for an M.P.C. of 3/4, e.g., the secondary effect would be:

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[1] Nugent, pp. 171-172.

[2] Keynes, p. 296.

$(\frac{1}{1 - 3/4} - 1)$ times the excess investment, or

Secondary effect = 3 (excess investment).

A tertiary effect is the induced investment resulting from the familiar acceleration principle due to the increased demand.

A contraction of effective demand, i.e., a reversal of the primary, secondary, and tertiary effects described above, occurs if, due to an excess of savings over investment, reduction of credit takes place. Primarily, the excess of saving means a reduction in the income stream and a corresponding reduction in consumption. Secondarily, the multiplier effect, less the primary effect, takes place. The multiplier in this case is based on the M.P C. of the decrement. A tertiary contraction of investment, as a result of the reduction in effective demand for consumption goods produced by the affected capital goods, completes the contraction phase.

Nugent carefully develops the concept of expanding consumer instalment sales credit as a source of "income-increasing outlay," contending that credit-based expenditures, whether made by producers or consumers, must be capitalized in order to have the stimulating effect described.[1] It can be argued that the method of accounting does not alter the effect of the added investment,[2] and Nugent later indicates that the only requirement is that the outlay be financed by borrowing otherwise idle funds.[1] His contention regarding capitalization is apparently designed to relate the purchase to the "investment" concept and visualizes the consumer as charging these high cost items to successive periods piecemeal, similar to the depreciation methods a businessman employs.

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[1] Nugent, p. 177.

[2] See Mors, pp. 64-65.

Nugent realizes, however, that, as stated above, the only important requirement is that the financing of the investment must be accomplished so that a withdrawal in one area does not counterbalance the additional income funds introduced in another area. The basis for his capitalization stipulation, then, is essentially to show the consumer instalment credit has the same effect as business or governmental capital expenditures, financed by a debt which is retired in instalments. Consumers' durables are, therefore, the capital goods of the household. His conclusion that an expansion of consumer instalment sales credit represents a "stimulating outlay" while a contraction represents a "depressing withdrawal" is, therefore, logical and consistent.

Nugent then considers the possible compensatory movements in other sectors resulting from instalment sales credit outlays. A case can be made for some increase in business saving, which might be required because of expansion of consumer credit, to finance receivables. This is a small and diminishing influence on the stimulating effect of the consumer credit expansion, essentially because there is a tendency to balance these increased receivables with short-term bank loans, and consumer credit is being financed increasingly by banks and nonbank financial intermediaries. In addition, if this credit were used merely in lieu of withdrawing and repaying individual savings, these movements would have no significance except to reflect the decisions of the individuals. Nugent believes that such is not usually the case. Therefore, he concludes that compensatory influences in other sectors are relatively unimportant, and the movements of consumer instalment sales credit balances may be treated as independent forces.

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[1] Nugent, pp. 180-181.

Having fitted consumer instalment sales credit into the Keynesian analysis, Nugent concludes that so long as the proper resources are not fully employed and are well distributed, qualitatively and geographically, any expansion of this credit will tend to induce some greater expansion of incomes and production to the extent indicated by the multiplier, while contraction of consumer instalment sales credit will, in a like manner, tend to produce multiple contractions of incomes and production. At full production and employment the classical position will hold true as a special case; an expansion of consumer instalment sales credit means increasing prices and a shift from producers' to consumers' goods. The use of macro-analysis has disclosed the interesting paradox that at the beginning of a recession period the wise decisions of individual debtors to get out of debt is inimical to the best interests of the economy as a whole.

Haberler's work shows further consideration and examination of the effect of consumer instalment sales credit fluctuations on the economy. He considers several of Nugent's assumptions which the latter had not fully explored and other points which Nugent had touched upon only lightly. One of these concerned the money supply. Even under conditions of incomplete utilization of the factors of production, the supply of money must be sufficient so that other possible borrowers are not restricted, in order for consumer instalment sales credit to have its full stimulating effect.[1] Another important question concerned the possibility that an increase in production in one industry due to expansion of consumer instalment sales credit will mean contraction in another. Much of the growth of the automobile industry has been attributed to the availability of consumer credit, and the public transportation industry has suffered as a result. Finally, he indicated the need for further investigation of the question of consumers' assets: (1) assuming instalment credit were not available, how might consumers apply them to the purchase of durables, and (2) in budgeting for repayments of instalment loans, how do consumers assess their assets.

The money market appears to offer a very elastic supply of funds for consumer instalment sales credit. Financial intermediaries in this field usually have good credit ratings and are prime customers in obtaining funds from the banking system, and the commercial banks make the primary decision regarding the availability of funds for their own consumer credit customers. The possibility of the money supply being tightened sufficiently to make the banking system unable to meet the requirements of a rapidly expanding volume of consumer instalment sales credit, without hamstringing the entire economy, is open to question. It should be noted also that, since the interest costs of instalment credit agencies are a negligible part of their total operating expenses, they may be less restricted by tight money situations than other borrowers, and we may assume for general discussion that the supply is elastic.[1]

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[1] Haberler, p. 32.

Consumer instalment sales credit has undoubtedly stimulated long-run structural shifts in demand from nondurables and services to durables. The increase in national income resulting from the growth in durables production has often been offset to some extent, therefore, by the reduction in the older industry. The decline of the motion picture industry in recent years, for example, must be attributed, at least in part, to the similar entertainment now offered in the comfort of one's living room through the medium of television. Thus we see that this decline is a countereffect in the economy which tends to offset the stimulating action of the consumer instalment sales credit expansion related to the purchase of television sets. The effect gradually diminishes as the new industry matures and consumers buy bigger, better, and more expensive models of the durable to replace those initially acquired, while the older industry stabilizes at a new level.

The expenditures for automobiles have seriously affected the public transportation industries. Many consumers who formerly used the services of bus, train and other transportation companies have been able to substitute private automobile travel, when the means for purchasing this durable good was provided. Not only has income in the transportation industry itself been reduced, but in addition, the capital goods production associated with this sector may have sustained an accelerated reduction.[1]

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[1] Haberler, p. 39.

The extent to which the latter effect occurs depends upon the rate of growth of the older industry at the time that the consumers' durable good enters into competition with it. If the older industry's demand for producers' capital equipment were small, due to its lack of expansion and failure to replace at the rate of depreciation, the total stimulus of the new industry's requirements would be felt. In contrast, if a still-growing older industry were faced with such competition, its capital equipment requirements would be sharply cut back, and this would tend to offset the new industry's growth from the standpoint of national aggregate totals.

Haberler on the whole agrees with Nugent that consumers would not accumulate the cash for most durables they now purchase on credit, if credit were not available. This is a reflection of the psychological bias in consumers' actions toward forced repayment of dissaving, represented by consumer instalment loans, over voluntary saving. In addition, although consumer assets are often sufficient to cover the cost of high-priced durables, there is ample reason to believe that many who now do not feel it worthwhile to liquidate long-term assets in order to avoid the cost of short-term instalment loans for the purchase of goods would feel the same in the absence of credit facilities. For this reason and because many do not have excess savings or assets to use, the conclusion seems justified that a smaller volume of purchases of consumers' durables would result, in the absence or restriction of consumer instalment sales credit. Nor are assets usually considered a source of funds for repayments. Repayments generally are provided for by reducing consumption expenditures. Therefore, the stimulating effect of instalment sales credit on aggregate demand can be observed by noting to what extent new credits outweigh repayments; conversely, the effect is depressing when repayments outweigh new credits.

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[1] See Albert Gailord Hart, Review of Nugent's, Consumer Credit and Economic Stability in Journal of Political Economy, XLIX (1941), 130.

In the long run the indications are that the direct influence of this credit is stimulating in any event, since new credits increase consumer spending but repayments only partially decrease it--they are partially provided for by the saving component of disposable income. Haberler appears to be in agreement with Nugent's Keynesian conception of secondary and tertiary effects. He concludes that "credit is an intensifying factor in business cycles--accentuating booms and deepening depressions . . . an amplifier of fluctuations set up by other forces."[1]

The cycles in instalment credit itself are directly related to the fluctuating volume of retail sales. The cycle of consumers' durables sales can be great in amplitude because of the nature of durable goods. A durable good may be characterized as a bundle of services that become available, successively, over a certain period of time. If the stock of durable goods is built up too quickly because of innovation, new styling, or model change, rather than actual need, we have the expansion phase of a replacement cycle in operation. The contraction is as sure to come as the bill collector.[1] Since the desire for these durables can be modified by economic considerations and psychological factors, their purchase can be spread over a longer period than originally contemplated, and the replacement cycle can be decelerated, just as in the case of producer goods purchases. A reduction of 25 per cent in the demand for automobile transportation services would conceivably cause the production of automobiles to drop temporarily very sharply to zero.[2] Thus consumer instalment sales credit makes for instability in the long run, because it induces consumers to apply more of their income and resources to the production and use of durable, rather than nondurable goods and services and durable goods have a built-in factor of instability.

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[1] Haberler, p. 134.

Reavis Cox Dissent

It is possible to discuss the effect of consumer instalment credit sociologically, psychologically, and economically as individual concepts, but Haberler had emphasized the need for considering all these frames of reference together as much as possible in order to develop the true picture. Cox has followed this approach and refutes Nugent's strong contention (supported by Haberler) that consumer instalment sales credit is an intensifying factor in business cycles.[1] He maintains that structural changes have taken place which have influenced previous cycles, but these are not in themselves cyclical. His case appears to be that the psychological and sociological attitudes toward consumer credit remain the same, regardless of business conditions, since he states that instalment credit "is available at any time, and regardless of the phase of the cycle, to any consumer who has an income that will enable him to show good prospects of paying his account. . . . Nothing in the nature of either durable goods or the instalment system requires consumers to concentrate their purchases in the boom periods of successive cycles."[2]

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[1] See John Kenneth Galbraith, The Affluent Society (College ed.; Boston: Houghton Mifflin Co., 1960), chap. xiv, for a discussion of this. Further comment will be made in Chapter II.

[2] Haberler, p. 131.

Cox recognizes the problem of acceleration of derived demand due to the nature of durable goods, but he attributes this not to instalment credit but to structural changes brought about by new or changed products. In discussing this principle, he characterizes any increase in instability as the stock of durables grows as the price consumers must pay for the rapid buildup of their stock of durables, and not a detrimental characteristic of instalment buying. There are vis-a-vis to this statement in Professor Cox's book, however, other statements which indicate his realization that consumer instalment sales credit is a powerful enough institution in the overall picture of our present economy to be named as the factor which allows consumers to build up a large stock of durable goods quickly. In the paragraph preceding the discussion above he says, "Insofar as instalment buying enlarges the stock of durables consumers accumulate by facilitating their purchase, it of course contributes to increasing the area of instability in the economy."[1]

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[1] Cox, chap. xxiv.

[2] Cox, p. 423.

The key to Cox's dilemma lies in this statement from the last paragraph of the same section: "If instalment buying can be held responsible for intensifying the problem of adjustment as growth slows down, it also deserves credit for speeding up the acquisition of durables."[2] Having built up such a good case for the advantage of instalment buying from the consumer's standpoint, because it affords him earlier possession of high-priced durables, he cannot easily hurl recriminations at the institution for its shortcomings, nor can he in good conscience ignore them. "To a consumer whose one life is ticking inexorably away, the benefits of earlier consumption may be well worth the cost of even a severe later adjustment."[3] What is true for the individual consumer, however, does not apply in the aggregate.

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[1] Cox, p. 429.

[2] Cox p. 429.

[3] Cox, p. 429.

Summation

Consumer instalment sales credit undoubtedly aids consumers in obtaining durables sooner and perhaps in a larger total amount than they would achieve otherwise. The concept of additional benefits to consumers of more leisure time and greater satisfactions is generally acceptable, although Chapter II will discuss the question further. The stimulating effect of consumer credit is felt in the accelerated derived demand resulting from the buildup of a stock of durables, and this, coupled with the deferable nature of the demand for durables, results in a potentially highly unstable condition. Although the effects of a growing demand for durables is often of the nature of structural change, such things as style change in an established durable goods industry can happen rapidly. The total picture approaches more closely Schumpeter's innovation theory of the business cycle than it does a secular trend.

This cyclical movement of the sales of consumers' durables may be in or out of phase with the cycle in general business. The application of the multiplier principle to the additional investment represented by a rise in consumer instalment sales credit could be recognized if the result could be isolated. Since it cannot, aggregate national income data cannot be related to the volume of consumer instalment credit without appropriate statistical analysis.

CHAPTER II

THE DEMAND FOR CONSUMERS' DURABLES AND INSTALMENT SALES CREDIT

Before considering directly the demand for consumer instalment sales credit, it is necessary to examine its raison d'etre, the demand for consumers' durables. Other elements enter into the decision to obtain credit of this type and have become integrated with the decision to purchase, but it is reasonable and proper to examine the basic decision first, as we would the framework of a house before the roofing and siding are added, for soundness.

The theory of demand, based on the assumptions of the economic man, pure competition, and partial equilibrium, can be viewed from the ordinal concept of value, by means of indifference curves, or from the cardinal concept, through marginal utility analysis, as almost equivalent interpretations. By using a monetary unit as one axis of an indifference map and also as the measure of utility in a marginal analysis, it is possible to logically relate the two theses. The indifference approach, while offering a more palatable explanation of the basis for consumer choice, did not attempt to improve upon the marginalist abstract pattern of behavior which human beings seem to approach only in the mass, for the aforementioned assumptions were retained.

To impose the realistic conditions of monopolistic competition with its differentiated products on that framework unfortunately muddies the waters so that neither concept provides much clarity. The resulting confusion of theory becomes chaotic when we investigate the psychological aspects of consumer behavior. One distrubing element is the effect of advertising and marketing methods on the demand of consumers for durables. A second is the effect of changes in consumer attitudes and expectations. These result in changes in willingness to buy and, therefore, as independent forces, alter the direction of changes in demand. These consumer reactions may be conditioned by exogenous forces such as international affairs or extreme weather conditions. They are also subject, however, to the endogenous factors in our economy and, therefore, serve to reinforce moderate changes, such as restrictions imposed upon credit, with a "feedback" effect, resulting in a greater impact than might initially be expected. The resulting consumer attitudes are not completely subject to quantitative analysis, but some pioneering work has been done in this area.[1]

Development of Demand Theory

The relative influence of supply and demand on value has been described as being equally important, as is the action of the two blades of a pair of scissors in cutting.[2] Members of the Austrian school, however, believed that wants were an independent force dominating production.[1] This was restated in essence as the concept, now generally considered to be antiquated, of consumer sovereignty:

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[1] George Katona, The Powerful Consumer (New York: McGraw-Hill Book Company, 1960), esp. chap. v. (Work of the Survey Research Center, University of Michigan, is described.)

[2] Alfred Marshall, Principles of Economics (8th ed.; New York: The Macmillan Company, 1949), p. 348.

> We know that man was created with infinite wants and desires that only await the knowledge of means to gratify them and purchasing power to get possession of these means. All advertising can do is to transmit the knowledge.[2]

An early recognition of the failings of orthodox theory, states that while the marginal utility school appears to assign to consumption a new leading role in economics, these theorists will not pursue the study of consumption further than they consider it necessary to enable them to formulate the laws of price.

> They did attempt to formulate in a general way the laws which govern choice and which explain consumers' activity, but, as it unfortunately happens, here is the weakest point in their whole body of thought. The most severe criticism has been directed toward this particular part of their work, the account they gave of human behavior as a selective or choice-making process. . . . We cannot recognize ourselves or our fellows in the hedonistic individualistic calculators whom they have described, nor find in their account any trace of the complexity of motives, impulses, and interests which lie behind market activities.[3]

The conclusion from this is that an adequate theory of consumption must comprehend an adequate theory of choice, one which will really make intelligible the consumers' behavior.

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[1] See Eugene Boehm-Bawerk, The Positive Theory of Capital, trans. William Smart (New York: G. E. Stechert & Co., 1930), p. 17 and chap. i, passim.

[2] George Burton Hotchkiss, "An Economic Defense of Advertising," American Economic Review, Supplement to XV (1925), 15-16.

[3] Hazel Kyrk, A Theory of Consumption (Boston: Houghton Mifflin Co., 1923), p. 17.

Although a note of realism was added to demand theory with the thesis that consumers cannot accurately measure utility but that they know whether one purchase is of more or less than or of equivalent utility to another,[1] this psychology is only slightly less naive than that of prior orthodox economic theory. "Hicks seems to expect the consumer to apply his ordinal utility ratings with a rigorous mathematical precision quite foreign to man's nature."[2] There is no recognition of habit or of the limitations to the extent that a buyer will go in seeking out preferred combinations, while at the same time the problems of differentiation are avoided by assuming conditions of pure competition and homogeneity within large groups of products, such as shoes and automobiles.

The psychological aspects of consumer demand are further qualified as follows:

> Consumers are not rational in the sense of operating as calculating profit-seeking mechanisms. In contradicting such old-fashioned notions, we must at the same time warn against accepting the other extreme point of view and believing that consumer behavior is governed by whims and fancies. . . . Impulsive buying does take place, but primarily when it does not really matter because it is a question of choosing among fairly equivalent products, or making small purchases, or occasionally deviating from one's usual careful shopping to enjoy some luxury.[3]

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[1] J. R. Hicks, Value and Capital (2nd ed.; Oxford: Oxford University Press, 1950), Part I, esp. p. 17.

[2] Ruby Turner Norris, The Theory of Consumer Demand (revised ed.; New Haven: Yale University Press, 1952), p. 54.

[3] Katona, p. 241. His findings will be given more extensive treatment below.

To devise a workable theory of demand "we must approach the consumer assuming that he is surrounded on all sides by groups of close substitutes, and further assuming that he is not homo economicus, but a creature of foibles, habits, and inertia."[1] Man has been characterized as "the most incalcuable, evanescent, and volatile element in the whole of social science,"[2] and, therefore, his ability or desire to make rational decisions at all times must not be assumed lightly. "The specific wants of mature individuals in our society are not rigid and fixed but rather malleable and adaptable."[3]

Consumers' psychological reactions, while less volatile in the aggregate than individual human characteristics, are nevertheless significant in their impact on the economy. The consumers' willingness to purchase durable goods may decline at a time of relatively high and stable incomes and may usher in a recession.

> The mechanistic assumption of a direct relation between need gratification and saturation is unwarranted. Intervening variables determine what happens following gratification of needs. Under the influence of adverse attitudes people may feel saturated. Similarly, being attracted by new goods or new features is not an automatic consequence of technological developments, but is dependent on receptive and optimistic attitudes.[4]

Although the realization that the "malleable and adaptable" nature of the consumer is greatly subjected to the influence of producers has received recent popularization,[1] recognition of the condition as an important influence in our economy is of long standing.[2] Under relentless pressure to buy which played upon every impulse, good and bad, the unfortunate consumer has been depicted as:

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[1] Norris, p. 57. Her "close substitutes" are clusters of competing or complementary goods.

[2] Norris, p. 61, citing Frank H. Knight, "Ethics and Economic Interpretations," Quarterly Journal of Economics, XXXVI (1922), 454-481.

[3] Norris, p. 64.

[4] Katona, p. 137.

> in the eyes of the producer simply one who is duty bound to buy. For the fulfillment of this duty, the only justification for his existence, the consumer must be educated. Consequently, the producer has taken this burden, in addition to all his other burdens, on his shoulders. The most subtle arts of advertisement, of propaganda, of high-pressure salesmanship, are used for this purpose.[3]

The plight of the consumer has been further delineated by other economists. A more recent description of the producers' relation to the consumers developed on the basis of a "dependence effect" thesis, that higher levels of production merely command higher levels of want satisfaction. To accomplish this end producers must not only convince the consumer that their products best satisfy his need for transportation, comfort, assistance in household chores, or use of leisure time; but a means must be provided for him to avail himself of the opportunity while he is young or, more particularly, before the long wait for him to save the purchase price.[4] While ardently contending that production creates its own wants, however, this view regards the role of advertising in the process with more restraint. Although the central function of modern advertising and salesmanship is to create desire, it is stated:

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[1] Vance Packard, The Waste Makers (New York: David McKay Co., Inc , 1960).

[2] See Stuart Chase, The Tragedy of Waste (New York: The Macmillan Co., 1929), first published in 1925; Plummer, pp. 8-9; and Broadus Mitchell, "Brief for the Consumer," The Annals of the American Academy of Political and Social Science, CXCVI (March, 1938), 9-13.

[3] Arthur Feiler, "The Evolution of the Consumer," The Annals of the American Academy of Political and Social Science, CXCVI (March, 1938), 6.

[4] Galbraith, chap. xi.

> Advertising is not a simple phenomenon. It is also important in competitive strategy, and want creation is ordinarily a complementary result of efforts to shift the demand curve of the individual firm at the expense of the others or (less importantly, I think) to change its shape by increasing the degree of product differentiation.[1]

A clear statement of the unequivocal position of those who believe consumer demand cannot be theorized with the orthodox assumptions, especially in light of the influence of advertising, declares that the opposing concept

> is based upon an implicit assumption of an economy of scarcity, populated by consumers who have unlimited wants which are very real, very urgent, and fully understood and calculated. The fact is that in the American economy, a substantial portion of total demand is demand which is in part created by sellers, which can be and is manipulated by advertising, model changes, and easy credit terms. The assumption of a consumer who is a rational, calculating measurer of pain and pleasure does not fit very well into the contemporary environment.[2]

Other economic writers are much less convinced that the role of advertising is dominant in the molding of consumer demand. Their contention is that producers react to changes in consumer tastes and buying inclinations, and at the worst advertising helps condition the consumer to meet the demands of his culture. His usual lethargy in meeting his obligations provides a substantial basis for the irrational behavior sometimes resulting from autonomous forces such as advertising.

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[1] Galbraith, p. 155n.

[2] U.S. Board of Governors of the Federal Reserve System, Consumer Instalment Credit (Washington, D.C.: Government Printing Office, 1957), Part II, Vol. 2, p. 107 (quoting Robert C. Turner in answer to the views expressed by Milton Friedman in the "Conference on Regulation," held in October, 1956 by the National Bureau of Economic Research).

Three general rules which consumers tend to follow based on this concept are:

1. The larger the expenditure, the more carefully the decision is weighed.
2. The more frequently goods are purchased, the greater the care and consideration used in their selection.
3. The poorer the consumer, the more carefully he will consider outlays.

Furthermore, all consumers have a margin below which no careful consideration is given to purchases. Its position in the individual consumer's scale of purchases depends upon the amount of his income, the temperament of the individual, and the amount of time he has available.[1]

Another view of the problem of the psychological bases of consumer choice recognizes central tendencies which provide a set of forces that dominates the behavior of must individuals. Nearly all purchases of goods are made, ostensibly at least, either to provide physical comfort or to implement the activities which make up the life of our culture. And since a rising standard of living is one of the major goals of our society, there is a constant striving for better quality goods to fill each need. This desire is ascribed to a drive for maintenance of self-esteem and the aim for a higher social status, which requires high consumption standards.[1] Although autonomous changes in taste can be produced by advertising and other sales efforts, any great rise in the stock of consumer durables due to these factors is considered doubtful. It is attributed to a self-generating shift in preferences based on the interdependence of one individual's preferences on the purchases of other individuals.[2] A noted writer in the field of advertising also agrees that the role of advertising is wrongly portrayed as that of a want-creator, stating:

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[1] Norris, pp. 64-71; Katona, pp. 241-242.

> Advertising can be profitably used only when it holds forth something that consumers need or can easily be made to desire. Advertising creates needs only in the sense that it makes the consumer aware that a product offers a satisfactory solution to a need; . . . latent desires or needs must be present.[3]

Although there exist many abuses to which the consumers' senses are subjected in the name of advertising, this statement represents the type of thinking expected of sound businessmen in the field of consumers' durables. Before a costly product is offered on the open market (accompanied by a vigorous advertising campaign to awaken all the latent desires) much research and study is undertaken to assure the prudent producer that the article will achieve public acceptance. Advertisers are anything but loath to play upon prestige and social status drives, however, and in so doing they may cause a shift to the right of the demand curve for their type of product (primary appeal) as well as for the individual brand (selective). This will usually be at the expense of another type of product, rather than by an increase in the propensity to consume. The latter remains fairly constant in the face of rising incomes and standard of living.[1]

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[1] James S. Duesenberry, Income, Saving, and the Theory of Consumer Behavior (Cambridge, Mass.: Harvard University Press, 1949), pp. 18-29.

[2] Duesenberry, p. 105.

[3] Neil H. Borden, The Economic Effects of Advertising (Chicago: Richard D. Irwin, 1942), p. 194.

An expression of an early writer in the field of consumption should be noted:

> There is much to lend support to the opinion that the real "directors of social energy" are the producers, that they do quite completely control the consumers' choices, and that the freedom of choice which his position in the market would seem to give him is a mere form. . . . Consumers' goods today are not made to order. Supply precedes demand and purchasers select from what is supplied. . . . As a matter of fact, it is quite obvious that the consumer is guided by other forces than the suggestions of the producers, that his course of action is determined by many independent and interacting factors, the product of his total environment. . . . Here is the field wherein, it is recognized, blind impulse, suggestion, custom, convention, and fashion all hold sway. The spending of income, which is the manifestation of consumers' choices, is truly, as Mitchell says, a neglected, backward, and conservative art.[2]

Demand Theory Applied to Demand for Consumers' Durables

Consumers' durables, of course, involve the long-run view of consumer expenditures. They are differentiated products subject to nonprice competition to a great degree. It has been noted that the buyer is forced to rely almost wholly upon the allegations of sellers.

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[1] Duesenberry, p. 111.

[2] Kyrk, pp. 99-104 and 187-188.

"Advertising is neither true nor false; its scientific accuracy is simply irrelevant."[1] The work of consumer research organizations has helped to alleviate this situation, but the potential buyer of a durable good must essentially base his decision on misleading information obtained from vested interests. If his rational nature, moreover, advises him to choose more practical products than the producers, through their advertising, would like him to buy, he is still faced with a dilemma. It is difficult for those who want to buy the minimum service, unadulterated and unadorned, to do so. Furthermore, his culture dictates that he strive for certain comforts. "Luxurious consumption has become a major goal of our culture--a goal which most people can never achieve, in all probability, and which, therefore, must result in a good deal of frustration."[2]

The need for luxurious consumers' durables as a status symbol in our culture has been manipulated by producers to induce greater purchases of their automobiles and appliances. Style changes and other forms of planned obsolescence are recognized methods employed by industry to maintain and increase sales, to the point where a "durable" has become known as a consumer purchase which will outlast the instalment payments. The groundwork for this approach was laid in a book written in the depths of the depression of the 1930's to provide a means of stimulating recovery:

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[1] Norris, p. 181.

[2] Norris, p. 179.

> Consumer engineering must see to it that we use up the kind of goods we now merely use. Would any change in the goods or habits of people speed up their consumption? Can they be displaced by newer models? Can artificial obsolescence be created? Consumer engineering does not end until we can consume all we can make.[1]

While adding a note of caution that it is the consumer engineer's job to see to it that his activities do not become disguised as another form of questionable selling, the position is clear. "Consumer engineering, then, is the science of finding customers, and it involves the making of customers when the findings are slim."[2] Using the tools of market research and other sources of consumer information the consumer engineer creates products the consumer will accept--but all to further "the organization and promotion of obsolescence, or, as it has been called, progressive waste, creative waste, fashion promotion, etc."[3]

The picture is completed with a justification for the consumers' acceptance of this treatment:

> Is there any use in having skirts short for a year or two and then suddenly letting them down? What use is there in having new models of automobiles appear every year? What use is there in a mouth-wash that doesn't kill germs? Or as far as that goes, what "use" is there in living in our modern cities at breakneck speed, making as much money as we can to spend it? We happen to like it. We object, we even make fun of ourselves and the way we live--but we like it enough to do it. Otherwise we would trek back to the land and live the simple life.[4]

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[1] Roy Sheldon and Egmont Arens, Consumer Engineering (New York and London: Harper & Brothers, 1932), pp. 13-14.

[2] Sheldon and Arens, p. 19.

[3] Sheldon and Arens, p. 55.

[4] Sheldon and Arens, pp. 65-66.

Constantly importuned to "keep up with the Joneses" by owning the latest model or the newest version of a multitude of labor-saving devices, the consumer of durables in today's economy is far from the rational man making his choice in an atmosphere of price-competition, while all other conditions around him remain unchanged. A scientific study of this problem of consumer psychology points out that:

> Economic psychology does not represent the opposite extreme of thought which would deny any influence to market factors. Psychological factors, such as motives, attitudes, expectations, and group belonging, are intervening variables operating between the stimuli of market conditions and the responses to them in the form of economic decisions. The psychological factors do not alone determine the final decision, but under certain conditions they are powerful enough to alter individual as well as mass reactions and thereby influence the entire economy.[1]

In the United States today millions of families are in a position to spend money on things above the level of necessities. Buying on credit is an acceptable and readily available means of purchasing goods, durables in particular. Reserve funds also have risen rapidly during and following World War II. Durables have become more important, and their inclusion in the consumer budget adds to its discretionary character. What psychological economics postulates is that changes in consumer attitudes and expectations are capable of influencing the proportion of income spent on discretionary purchases and sometimes, often at crucial times, do so. The affluence of our economy tends to create more of an atmosphere where decisions are generally less carefully made. At the same time mass production has shifted the supply of consumers' durables further into this area. In the aggregate a tendency toward less informed decisions regarding the purchase of durables exists, due to the infrequency of their purchase and the complexity of their construction. The conclusion can be reached, therefore, that the consumer, subject to this atmosphere and the pressures from producers and society will strive to take the supply of durables off the market, depending upon his financial ability and his attitude. The familiar concept of expectations can be applied to consumer investment, therefore, and along with present income and the assets resulting from prior income. This provides a basis for the consumers' purchase decisions regarding durables.

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[1] Katona, pp. 5-6.

Another hypothesis has been developed to show that consumers base their decisions on the "permanent" component of their disposable income. This "distinguishes sharply between income as recorded--which we term measured income--and the income to which consumers adapt their behavior--which we term permanent income--and, similarly, between measured consumption and permanent consumption."[1] Although this is admittedly a difficult concept to define precisely, a resulting theory of consumption is based entirely on this dichotomy, apparently relying on the general view that simplified theory can yield implications useful for realistic analysis more successfully than if more complex basic assumptions were attempted. There are numerous factors which weigh heavily against acceptance of this hypothesis.

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[1] Milton Friedman, A Theory of the Consumption Function (Princeton: Princeton University Press, 1957), p. 221.

> Following a fixed or preplanned course of behavior, uninfluenced by unexpected events, appears as improbable as not learning from experience and not changing one's behavior according to what one has learned. That windfall gains are not used for additional consumer expenditure--both on durables and on nondurables and services--likewise appears improbable in view of what is known about the effects of good news on behavior.[1]

An attempt to substantiate this theory with an analysis of available data, relies on the strength of its assumptions and is thereby begging the question. The resulting discussion of the consistency of the permanent income hypothesis with time series data posits that if the factors on which the ratio of permanent consumption to permanent income depends were "roughly constant or offsetting for the period 1897-1949, the ratio of permanent consumption of permanent income would have been a constant during this period." Since the ratio was not always a constant but was above or below the average figure in certain years, viewing the ratio as a straight line relationship, it is concluded that, "on this superficial level, the scatter is not inconsistent with the hypothesis that the observed points were generated from points on the central line by the addition of transitory components of both income and consumption."[2] The particular deviations are explained by characteristics of the periods in which they occurred. In making these assumptions and comparing the hypothesis with other approaches, no appreciable significance is attributed to the possibility that factors other than income may influence the aggregate consumption expenditure. As has been noted, consumer attitudes and the surrounding economic factors, including those which contribute to these attitudes, can have a decided effect on their purchase decisions, and it must be concluded that these can better account for the residuals from an approximate straight line relationship between personal disposable income and consumption expenditures.

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[1] Katona, p. 153.

[2] Friedman, pp. 117-118.

The Demand for Consumer Instalment Sales Credit

Factors Related to the Demand for Durables

The close direct relationship between the demands of consumers for durable goods and the ensuing demand for instalment credit is indicated by the data of Table 1 and depicted in Figures 1 and 2. The amount of instalment sales credit granted in recent years has become approximately three-fourths the dollar volume of consumers' durables purchased in the corresponding periods. The picture is somewhat obscured by the fact that the extensions of sales credit include purchases by individuals who may intend to use the durables partly for noncorporate business, while the corresponding expenditures data have been adjusted to exclude any consumers' expenditures for business purposes. The data on instalment credit extended for other consumer goods also include some non- or semi-durables. In addition, these extensions include renewals and refinancing of loans against durables purchased in prior years (by the original owners and by purchasers of used durables). The volume of instalment sales credit outstanding is also shown for

TABLE 1

GROWTH OF THE CONSUMERS' DURABLE GOODS SECTOR
(Amounts in millions of dollars)

End of Year	Value of Stock End of Year[a]			Expenditures[a]			Instalment Credit Extended[b]			Instalment Credit Outstanding End of Year[b]		
	Total	Auto mobiles	Other Durables	Total	Auto-mobiles	Other Durables	Total	Auto-mobiles	Other Consumer Goods	Total	Auto-mobiles	Other Consumer Goods
1945	33,401	4,770	28,631	9,410	63	9,347	3,023	999	2,024	1,271	455	816
1946	40,182	6,048	34,134	18,805	2,855	15,950	5,046	1,969	3,077	2,271	981	1,290
1947	48,617	8,923	39,694	22,897	4,972	17,925	8,190	3,692	4,498	4,067	1,924	2,143
1948	55,906	11,786	44,120	24,118	5,678	18,440	10,600	5,217	5,383	5,919	3,018	2,901
1949	62,810	16,040	46,770	25,750	7,957	17,793	12,832	6,967	5,865	8,261	4,555	3,706
1950	73,469	21,728	51,741	31,451	10,631	20,820	15,680	8,530	7,150	10,873	6,074	4,799
1951	77,994	24,566	53,428	28,527	8,854	19,673	16,441	8,956	7,485	10,852	5,972	4,880
1952	81,084	25,705	55,379	27,779	7,676	20,103	20,950	11,764	9,186	13,907	7,733	6,174
1953	87,380	29,315	58,065	32,362	10,772	21,590	22,208	12,981	9,227	16,614	9,835	6,779
1954	91,470	31,809	59,661	31,633	10,448	21,185	20,984	11,807	9,177	16,560	9,809	6,751
1955	100,730	37,161	63,569	38,738	14,312	24,426	27,376	16,734	10,642	21,101	13,460	7,641
1956	106,276	38,878	67,398	37,252	11,614	25,638	27,236	15,515	11,721	23,026	14,420	8,606
1957	110,702	40,404	70,298	37,760	11,911	25,849	28,272	16,465	11,807	24,184	15,340	8,844
1958	111,176	38,985	72,191	34,750	9,065	25,685	25,973	14,226	11,747	23,180	14,152	9,028
1959[c]	116,025	40,291	75,734	40,102	11,866	28,236	31,761	17,779	13,982	27,050	16,420	10,630
1960	120,497	41,788	78,709	41,339	12,486	28,853	32,124	17,654	14,470	29,213	17,688	11,525
1961	123,033	41,678	81,355	40,736	11,110	29,626	30,585	16,007	14,578	29,080	17,223	11,857
1962							35,481	19,796	15,685	32,145	19,540	12,605
1963							39,020	22,013	17,007	35,965	22,199	13,766

[a] U.S. Board of Governors of the Federal Reserve System, unpublished data, 1961. (Xeroxed.)

[b] U.S. Board of Governors of the Federal Reserve System, Consumer Credit Statistics, February 1963, for 1946 through 1961; Federal Reserve Bulletin for 1962 and 1963.

[c] Includes Alaska and Hawaii thereafter.

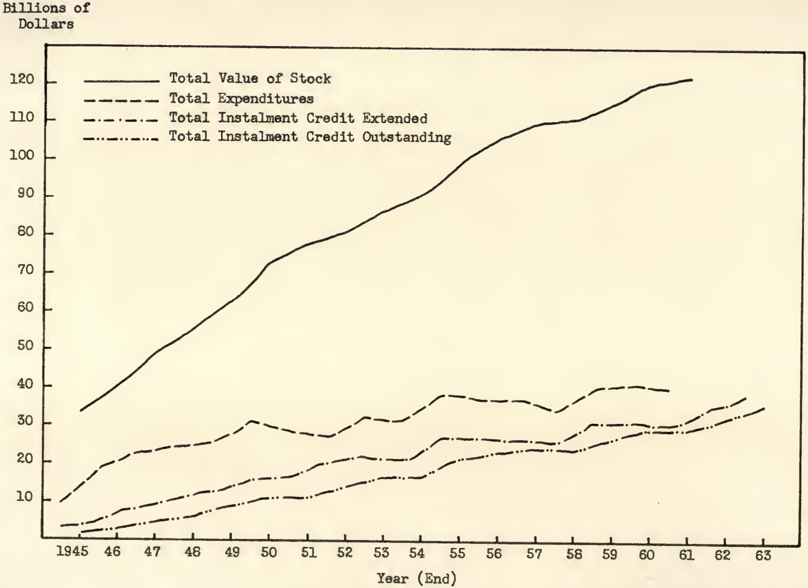

Figure 1.--Growth of the Total Consumers' Durable Goods Sector.

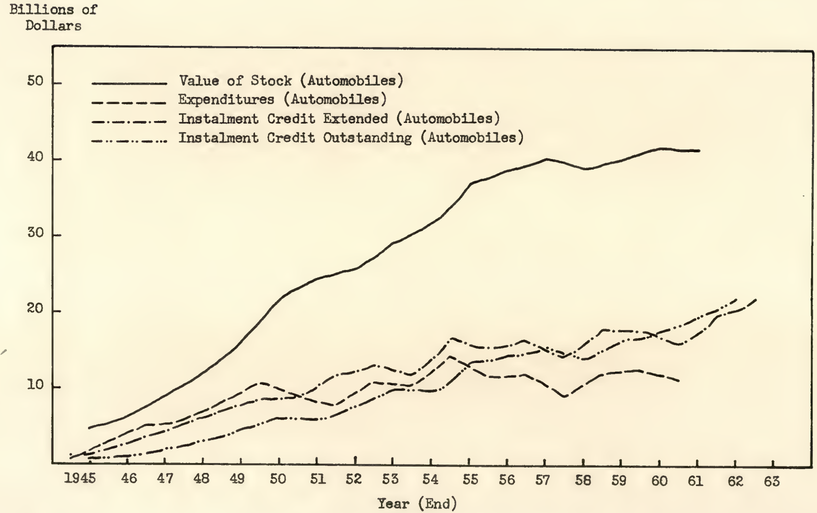

Figure 2.--Growth of the Automobile Sector.

comparison. The outstandings reflect both extensions and repayments. These distorting factors particularly apply to automobiles and will be discussed further in that section. It can logically be inferred, nevertheless, that the portion of sales of consumers' durable goods financed by instalment credit is substantial enough to warrant the inclusion of the factors involved in the demand for consumers' durables in the demand for consumer instalment sales credit also.[1]

When instalment credit is considered, however, the perspective is changed and additional factors enter the picture.

> If they are to undertake an instalment sales debt at all, consumers ordinarily view the savings component or their liquid assets as a source of funds to meet down payment requirements rather than as a source of funds to meet instalment payments. Accordingly, since additional purchases are likely to increase the individual's debt burden, they will ordinarily be avoided except where current and anticipated income is thought to be adequate. In the short run, therefore, the demand for instalment sales credit is chiefly dependent on current and anticipated incomes.[2]

Thus, current income--not just the permanent component--and expectations are felt to be important factors to be considered in the demand for consumer instalment credit. "It may be observed, however, that sizeable increases in income may have the effect of encouraging cash rather than credit purchases, and the long-run effect of an income increase may be similar."[3]

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[1] See Avram Kisselgoff, Factors Affecting the Demand for Consumer Instalment Sales Credit (New York: National Bureau of Economic Research, January, 1952), p. 5, for similar comments regarding his study of the 1929-1941 period.

[2] Kisselgoff, p. 8.

[3] Kisselgoff, pp. 5-6.

One element of the "permanent income" hypothesis that presents an approach appropriate for consideration in this study is the concept of consumption that includes the use value of major consumer durables as savings.[1] Since the advent of the FHA mortgage, consumers have come to consider the increased equity resulting from their monthly payments as a form of saving and investment, or "consumers' capital financing." In a letter to the Wall Street Journal, a reader tells of the growth of his initial $600 downpayment on a low cost house in 1953 to a $9,000 equity in a better house in 1961 with no additional outlay of capital, other than the principal portion of the monthly payment.[2] Similarly, consumers tend to regard their stocks of durables as investment and intuitively think of them as assets subject to depreciation. Instalment credit has aided them in developing this concept. Paying the instalments is similar to charging a portion of income to depreciation and allocating another portion to saving. When an automobile, refrigerator, or other appliance is free and clear, the budget may be in a position to include the monthly payments on a replacement article. It is often the case also that the old durable will be of sufficient value to cover the downpayment requirement on the replacement.

The influence of advertising appears not only indirectly through the demand for durables but directly. Retail establishments and producers use easy credit terms as a means of stimulating interest in the purchase of durables. Sales finance companies, banks, and credit unions engage in advertising aimed directly at encouraging the consumer to obtain this credit. They do so by describing in glowing terms the pleasure of owning the durable, along with the simplicity and low cost of obtaining the instalment loan. The demand for consumers' durables normally would be expected to respond to price changes in a manner indicated by the price elasticity of demand for the particular product. In translating the demand for durables into the demand for consumer instalment sales credit, however, price loses much of its significance. Advertisements and salesmen tend to refer only to the amount of the monthly payment when aiming toward or dealing with the credit customer. To the consumer a moderate price rise divided by twelve or more payments is not an appreciable addition to his monthly budget. In fact, it may even be absorbed by adding one or two payments and leaving each one the same amount as prior to the price increase. It should be noted, however, that most of the customers using instalment sales credit have modest incomes, and significant changes in the prices of durable goods might be expected to affect consumer purchasing decisions.[1]

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[1] Friedman, p. 230.

[2] Wall Street Journal, July 18, 1961, p. 10.

In a similar vein instalment credit should be little affected by changes in interest rates. Reduced rates for savers might influence some to use their cash to make purchases instead of credit, but the elasticity of demand for instalment credit with respect to finance charges appears to be very low. This is because, once again, any appreciable change in the charge for the total contract would usually be presented to the consumer as a change in his monthly payments. This amount of change, therefore, would usually be one-twelfth or one-eighteenth or less of the total. It may be seen that if the simple interest equivalent of finance charges on a 30-month contract for an original unpaid balance of $1500 is 6 per cent per annum, the monthly payments are $54.00. At 9 per cent they would be $56.00, and at double the original rate or 12 per cent, $58.00.[1] As will be discussed further in Chapter III below, the cost of credit is a small portion of the total cost of operation which determines the financing organization's charge to the consumer, and, therefore, a percentage change in this cost (interest rate) to them would be reflected in a much smaller percentage change in the consumers' charge, ceteris paribus. It is the contention of the proponents of legislation requiring full disclosure of interest rates to instalment borrowers that by so doing cyclical fluctuations would be reduced.[2] To feel that those who until now have paid little heed to the absolute cost of instalment buying (the total of any series of payments could always have been ascertained) would be greatly influenced by the rate of simple interest involved would seem to be holding to a forlorn hope, albeit a desirable goal.

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[1] Kisselgoff, p. 17.

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[1] Haberler, pp. 100-101.

[2] Wall Street Journal, July 18, 1961, p. 4.

Other Contributing Factors

The amount of downpayment required and the length of the period in which repayment must be made are important influences on the demand for consumer instalment sales credit. In the specific area of downpayment, not only the variation in requirements (of the seller or financing agency) but availability in terms of consumers' liquid assets will have a significant influence on the amount of instalment credit granted. Thus, it has been noted:

> An accumulation of liquid assets can have a stimulating effect on demand by facilitating down payments, provided the expansion is feasible in terms of the level of income. Contrariwise, a decrease in holdings of liquid assets, constituting a drain on funds usable for down payments, might, other things being equal, have a depressing effect on the demand for instalment sales credit.[1]

On the other hand, there is a point at which a reversal takes place and greater holdings of liquid assets would lead to a greater tendency to pay cash rather than buy on instalments. The aggregate effect would be contingent on the distribution of holdings of liquid assets.

Changes in such elements as this distribution of liquid assets; consumer buying habits, taste, and preferences; distribution of the total income; and size and number of family units all have their effect on the amount of consumer instalment sales credit demanded. These are generally characteristics which change slowly over the long-run and can probably be accounted for by the element of secular trend. Population growth might also be considered to be in this category. However, if all quantities were converted to a constant consumer unit basis, consideration of this factor's effect would be obviated.

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[1] Kisselgoff, pp. 8-9.

A full analysis of the problem should take into account the effect on the demand for instalment sales credit of changes in the stock of durable goods in the hands of consumers. Although it appears intuitively that the stock of durable goods should generally follow the marginal utility pattern, so that its growth (on a per capita basis) would indicate a potential slackening in demand for additional increments, the corresponding increase in the eventual need for replacements for this stock would tend to accentuate demand. This apparent paradox results from applying the static concept of demand to a situation that exists over a period of time. Overriding all this is that characteristic of consumer durables through which an impetus is impressed on cyclical fluctuation: the postponing of their purchase, which is possible because they are budgeted from the nonallocated or supplementary portion of disposable income and form a "bundle of services" whose use may be extended when necessary. A replacement cycle occurs due to the stock of durable goods being built up too quickly resulting from an optimistic outlook on the part of consumers coupled with the ready availability of credit, and this unsustainable rate then falling off rapidly when demand has been somewhat satiated, especially if an aura of uncertainty for the future prevails. Viewed in this context the value of the stock of durables in the hands of consumers should make an important contribution to the demand for instalment sales credit.

The most important factors for considering an individual spending unit's probability of owing instalment debt have been said to be its liquid assets holdings, its income, and its stage in the family life cycle or the age of the head of the unit.[1] The first two factors have already been discussed on an aggregate basis. For this study, the third would not appear as a variable, as it would in a cross section analysis, but as a component of the trend element. Noteworthy also is the fact that families who own their homes free of debt are unlikely to borrow on the instalment plan, while those who owe debt on their homes are likely to owe instalment debt.[2] This is indicative of the consumer characteristic of equipping the home in the early stages of the life cycle, while the mortgage is being paid off. The continuing trend of a decreasing farm population contributes to the growth of consumer instalment sales credit since it has been shown that farm families are less likely to use such credit and those who do borrow obligate themselves to smaller payments than nonfarm consumer units.[3] It has also been found in a cross-sectional analysis that existing consumer debt influences the acquisition of durables and especially the incurrence of any further debt for that purpose, and that there are interrelations between debt and liquid assets, debt and current income, and debt and previous income.[4]

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[1] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 1, p. 487.

[2] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 1, p. 511.

[3] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 1, p. 488.

[4] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 1, p. 541.

In applying conclusions based on analyses of cross-sectional data, the transition to an aggregative approach must be cautiously assayed lest we be guilty of the fallacy of composition. "Additions to debt are negatively related to current income and positively related to previous income among low-income spending units, where borrowing is frequently an emergency measure. These relationships are reversed at higher income levels."[1] The aggregate relationship between debt additions and current income is, therefore, of an indeterminate nature, based upon the information given above. Similarly, it cannot be arbitrarily concluded that the total amount of residential mortgage debt has a net positive relationship to the total amount of the consumer instalment debt outstanding, because families with a mortgage on their homes are more likely to have consumer debt also. These results do, however, provide the basis for considering the inclusion of such factors in a statistical analysis of the demand for consumer instalment sales credit.

Summation

Consumer demand for instalment sales credit is affected by numerous economic and psychological factors. Total price of a durable good appears to be of only moderate importance, but in terms of the size of the monthly instalment payment price assumes greater significance.

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[1] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 1, p. 541.

Changes in all the other factors which shape consumer decisions result in shifts in the demand function. The "unlimited wants" of the economic man are realistically affected by many practical considerations. The first group of considerations consists of present income, the present effect of past income, and consumer expectations for the future.

Current disposable income is the source of newly available purchasing power, much of which is already committed. Small fluctuations in this aggregate total, therefore, signify larger changes in the uncommitted portion. Personal saving is one component of past income which can be viewed in its original form. This element relates the saving function from the preceding period to the present credit decision.

Consumers will speculate concerning future income and form opinions, which, if surveyed with the use of proper methods may show a close relationship to the subsequent volume of instalment sales credit. A significant question for study, however, is: Do these consumer opinions represent more than a reflection of the quantitative factors which can be separately studied? This does not take into consideration disruptions from forces exogenous to the system such as sudden political, sociological, or physical changes or actions. These might, of course, influence consumer decisions unaccompanied by any specific quantitative variable. What needs to be answered is whether, aside from these unusual external disruptions, the consumers' thinking differs from that of an economic man who is more sophisticated and works with a greater number of variables of input and output than was formerly ascribed to him.

The second group of variables for this total picture of consumer demand is concerned with the consumer credit structure. The ability of the consumer to obtain and budget for additional credit extensions must be related to the present amount of debt to which he is already committed. While present and past income have provided the cash portion of expenditures on consumers' durables, his future ability to meet monthly payments is the principal criterion for the credit portion. Some consideration of total indebtedness in itself still influences individual consumer credit decisions, and in a multiple regression of aggregate variables, the amount already outstanding may have an influence, the degree or significance of which can be determined in the analysis. Here it combines with other variables to reflect the aggregate reaction of consumers to this factor.

This indebtedness must be considered in two distinct categories, however. Mortgage debt differs from other consumer instalment sales credit so markedly that it is not generally considered as part of it, as in this study. It is of much longer term and is secured by collateral which depreciates very slowly, is enhanced by considerable pride of ownership and provides an essential part of existence. Mortgage debt may be correlated positively with the extension of credit for durables in some strata of consumers but not necessarily in all. Its influence appears to be significant but the net nature and extent of this influence must be determined by investigation.

One factor which combines the features of both groups is that of the stock of durables already in the hands of consumers. First, the stock is a component of past income, but of past consumption, not saving. Second, it provides a means of making a downpayment on future purchases of similar durables. In this second capacity it could be positively related to instalment sales credit outstanding, but negatively to credit granted, since the greater the value of the durables used for downpayment, the smaller the amount of additional credit needed. A large dollar value of the stock of durables may also indicate that consumers could easily postpone purchases and continue to use more of the "bundle of services" they already have. It is a variable whose significance may be far-reaching and multi-faceted.

Before these factors are tested in multiple regression equations, however, supply factors must be considered. The total picture of the supply of consumer instalment credit will be investigated next and the appropriate variables to be added to the regression equations will be determined. With all the variables of this study which relate to consumer instalment sales credit extensions thus accounted for, the multiple regression analysis will proceed from that point.

CHAPTER III

THE SUPPLY OF CONSUMER INSTALMENT SALES CREDIT AND ITS RELATIONSHIP TO MONETARY POLICY

Sales Finance Institutions

Early Developments

The development of financing agencies for consumer instalment sales credit has roots in the old practice of borrowing money by pledging receivables. Manufacturers of such costly items as pianos found, in order to expand, that they had to finance instalment sales by extending credit to dealers. These extensions were first for the purpose of financing inventories, but they soon began to bear a closer relationship to retail financing. Piano manufacturers were financing dealers' inventories and conditional sales by 1875, and by 1890 this was common practice in the industry.

In 1904 the Foster-Armstrong Company, a piano manufacturer, formed what was perhaps the first instalment finance company in the United States, the Fidelity Contract Company (later the Commercial Security Company), for the purpose of purchasing retail instalment contracts from Foster-Armstrong dealers. The further development of this business, however, required the institution of the system of nonnotification, which was put into effect in 1905 by the Mercantile Credit Company of Chicago. By obviating the objection of retail establishments to having their customers notified to make their instalment payments elsewhere, this system laid the groundwork for the evolution of the credit or finance company as a valuable aid in selling consumer goods. The Mercantile Credit Company dealt only in open-book accounts at the time they originated the system, but this was soon adapted to instalment credit procedures also. The Commercial Investment Trust Corporation of St. Louis was the first to purchase retail instalment contracts from unaffiliated dealers in 1909. The next year the Commercial Credit Corporation of Baltimore began the same type of operation. By 1916 at least a dozen such companies were purchasing instalment contracts arising from retail sales of pianos and automobiles.

The establishment of the Morris Plan of Industrial Banking in 1909 was an important step in the growth of consumer instalment credit, since their loans were primarily for consumption purposes. They entered the field of automobile instalment loans in 1910, thus helping to lead the way in this area, although they abandoned the idea a year later. The first credit unions were established in the same year as the Morris Plan and they too have contributed to the growth of consumer instalment sales credit, although the volume resulting from their operations is only now becoming significant.

Commercial banks began to make instalment loans in 1917, and by 1920 about thirty were engaged in instalment lending or financing, some handling automobile purchases. They were cautious in the selection of their customers, and in their complete acceptance of this type of business. It was 1923 before the first personal loan department was designated as a separate unit of the bank, for example. After 1928 this type of operation was generally accepted, and the growth of the departments concerned was much more rapid.

Automobile Sales Finance

Nugent credits W. P. Smith and Company of Seattle with doing the first automobile instalment financing in 1910, as an adjunct to their insurance business. This was a service for purchasers of commercial vehicles only.[1] In 1913, L. F. Weaver, a wagon and buggy dealer in California for 15 years, cautiously began what appears to be the first passenger car financing. Others followed suit in the next few years so that by 1917 there were at least 25 enterprises financing instalment sales of automobiles.[2] Many of these were formed from organizations already operating in some field of finance, such as the insurance business, some as separate concerns, others as an additional operation of the original businesses.

Many large organizations were in the field by the mid-1920's. General Motors Acceptance Corporation was launched by the parent manufacturer in 1919, while the others for the most part were independently organized and financed. By 1925 there were sixteen or seventeen hundred companies, and, due to the intense rivalry, especially among the smaller ones, many new methods of financing were offered which made credit sales more attractive to the dealer. Dealer indorsement of the paper was no longer required, and the system of nonrecourse came into acceptance. Along with these developments the credit terms to the purchaser were gradually liberalized by the reduction of downpayments and extension of the time for repayment. Although pianos, appliances and other durables were being financed by these companies also, "it was the automobile industry which gave intermediary financing a position of major importance in the field of consumer credit."[1]

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[1] Nugent, p. 80.

[2] Nugent, p. 80.

To regain the instalment credit business of General Motors dealers lost to independent finance companies due to these competitive devices, GMAC inaugurated late in 1925 dealer profit participation in the finance charge, and exercise of control by General Motors of the wholesale and retail financing part of the dealers' business.[2] As a result GMAC volume for 1926 increased by about 225 per cent over 1925. For the same period General Motors sales increased by about 40 per cent. This program rapidly spread through the automotive industry, and Chrysler and Commercial Credit soon established an affiliation to use similar methods. Ford followed in 1926, forming Universal Credit and applying the same techniques.[3] These payments to dealers were referred to as a "repossession loss reserve," but they were felt to exceed greatly any required amount for this purpose.

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[1] Nugent, p. 80.

[2] Russell Hardy, "Another View on the Origin of Dealer Participation in Automobile Finance Charges," Indiana Law Journal, Vol. 30, No. 3 (Spring, 1955), cited in "Competition and Conflict," Time Sales Financing, XXV, No. 1 (January-February, 1961), 6-7.

[3] "Competition and Conflict," pp. 6-7.

As a result independent nonrecourse companies began to pay pure bonuses to dealers in the "pack," as the dealers' part of the finance charge is now known. This competition for instalment credit business in the 1920's raged hot and heavy as the dealers, loaded with cars to sell by the manufacturers, granted excessive trade-ins and made up for them by increased participation in the finance charge.

Considerable pressure was being brought to bear on dealers to use the manufacturer-owned or -affiliated sales finance companies. In May, 1936 an antitrust suit was instituted against the big three and their associated finance companies. As a result, Chrysler divested itself of the Commercial Credit Company, and Commercial Investment Trust Corporation purchased Ford's interest in Universal Credit Corporation. Chrysler and Ford signed consent decrees in November, 1938, but General Motors fought the suit. Although General Motors was found guilty and the judgment affirmed in 1941, the civil suit then filed, which sought divestiture of GMAC from General Motors, dragged on due to the war. A final decree was entered in 1952, but it did not force General Motors to divest itself of GMAC.

Bills were introduced in congress in 1959 to prohibit such "monopolistic privileges";[1] but, although hearings in February and April of 1959 disclosed that GMAC was doing 41 per cent of the sales finance company financing of all automobiles, the next three largest companies did 32.5 per cent, and the remaining 26.5 per cent was divided among 400-500 regional and local companies, action was postponed on the legislation. Apparently heartened by the 1959 postponement, Ford in 1960 established a new affiliate, the Ford Motor Credit Company.[1]

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[1] "Competition and Conflict," p. 10, quoting from Senate bills 836 and 839 and H. R. 4256.

Growth and Change

By the end of 1922, the principal techniques of sales finance had been established.[2] Instalment credit agencies had already responded to the needs of the growing automobile industry and now saw a similar opportunity to provide the means for placing a variety of numerous new and improved appliances in the hands of consumers and thus to aid in the expansion of the industries producing them. The rapid growth of instalment loans which resulted is compared with other elements of consumer credit in Table 2 and Figure 3.

Following an era of rapid growth in the 1920's, the amount of consumer credit outstanding was reduced sharply during the period 1929-1933. Lenders were extremely cautious and debtors showed a remarkable proclivity to repay loans, even in these difficult times. As prosperity slowly returned and the tempo of business quickened, consumer credit outstanding resumed its growth. By 1935 instalment credit comprised more than half of the total of all consumer credit, and by 1939 the total volume of instalment credit was higher than that of 1929, even though noninstalment credit was still almost 25 per cent below

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[1] "Competition and Conflict," p. 15.

[2] See Nugent, p. 92.

TABLE 2

SHORT- AND INTERMEDIATE-TERM CONSUMER CREDIT OUTSTANDING BY MAJOR PARTS
(Millions of Dollars)

End of Year	Total	Instalment				Noninstalment
		Total	Automobile	Other Durables	Other	
1919	2,642	800	304	409	87	1,842
1920	2,964	969	376	490	103	1,995
1921	2,966	919	317	484	118	2,047
1922	3,166	1,047	295	619	133	2,119
1923	3,652	1,368	526	684	158	2,284
1924	4,025	1,646	670	779	197	2,379
1925	4,715	2,115	914	951	250	2,600
1926	5,227	2,363	977	1,083	303	2,864
1927	5,344	2,319	765	1,183	371	3,025
1928	6,258	2,935	1,134	1,331	470	3,323
1929	7,116	3,524	1,384	1,544	596	3,592
1930	6,351	3,022	986	1,432	604	3,329
1931	5,315	2,483	684	1,214	565	2,852
1932	4,026	1,672	356	834	482	2,354
1933	3,885	1,723	493	799	431	2,162
1934	4,218	1,999	614	889	496	2,219
1935	5,190	2,817	992	1,000	825	2,373
1936	6,375	3,747	1,372	1,290	1,085	2,628
1937	6,948	4,118	1,494	1,505	1,119	2,830
1938	6,370	3,686	1,099	1,442	1,145	2,684
1939	7,222	4,503	1,497	1,620	1,386	2,719
1940	8,338	5,514	2,071	1,827	1,616	2,824
1941	9,172	6,085	2,458	1,929	1,698	3,087
1942	5,983	3,166	742	1,195	1,229	2,817
1943	4,901	2,136	355	819	962	2,765
1944	5,111	2,176	397	791	988	2,935
1945	5,665	2,462	455	816	1,191	3,203
1946	8,384	4,172	981	1,290	1,901	4,212
1947	11,598	6,695	1,924	2,143	2,628	4,903
1948	14,447	8,996	3,018	2,901	3,077	5,454
1949	17,364	11,590	4,555	3,706	3,329	5,774
1950	21,471	14,703	6,074	4,799	3,830	6,768
1951	22,712	15,294	5,972	4,880	4,442	7,418
1952	27,520	19,430	7,733	6,174	5,496	8,117
1953	31,393	23,005	9,835	6,779	6,391	8,388

TABLE 2 (Continued)

End of Year	Total	Instalment				Noninstalment
		Total	Automobile	Other Durables	Other	
1954	32,464	23,568	9,809	6,751	7,008	8,896
1955	38,830	28,906	13,460	7,641	7,805	9,924
1956	42,334	31,720	14,420	8,606	8,694	10,614
1957	44,970	33,867	15,340	8,844	9,683	11,103
1958	45,129	33,642	14,152	9,028	10,462	11,487
1959	51,542	39,245	16,420	10,630	12,195	12,297
1960	56,028	42,832	17,688	11,525	13,619	13,196
1961	57,678	43,527	17,223	11,857	14,447	14,151
1962	63,164	48,034	19,540	12,605	15,889	15,130
1963	69,890	53,745	22,199	13,766	17,780	16,145

Source: U.S. Board of Governors of the Federal Reserve System, Consumer Credit Statistics, February 1963, for 1919 through 1961. Federal Reserve Bulletin, appropriate issues for 1962 and 1963.

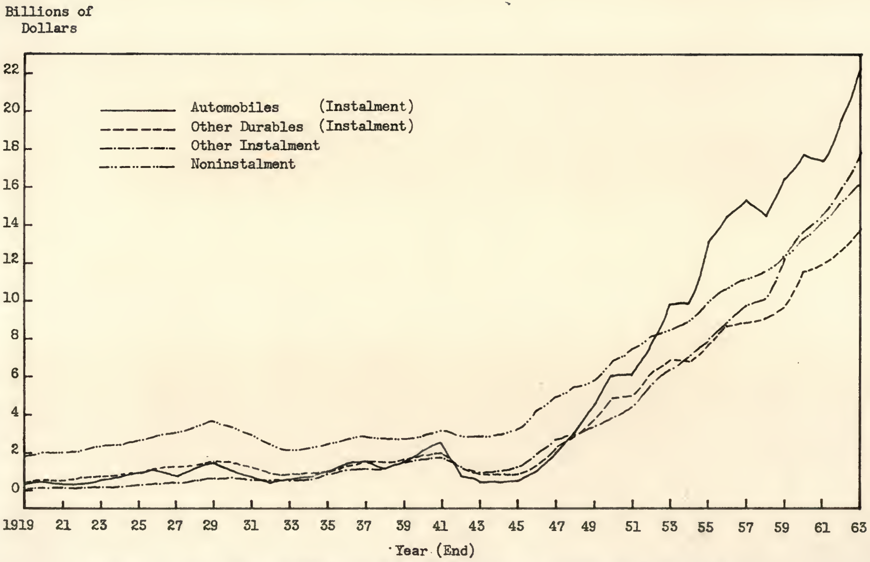

Figure 3.--Short- and Intermediate-Term Consumer Credit Outstanding by Major Parts.

the 1929 level. The years of World War II saw a decline in all forms of consumer credit, particularly instalment. The controls of Regulation W coupled with the scarcity of consumer goods were obvious causes of this. Following the cessation of hostilities, consumer credit resumed its rapid rise with all forms of instalment credit growing more rapidly than noninstalment. Automobile instalment credit, as will be discussed fully later, has achieved perhaps the most spectacular growth while exhibiting considerable erratic behavior.

The attitude of commercial banks toward consumer lending has continued to undergo considerable change. Since 1934 banks have been a competitive force in the sales finance field. By that time the soundness of the consumer instalment sales credit business was well established, and the slack in the banks' traditional business of loans for commercial purposes was being sorely felt. The growth of the commercial banks' participation in the sales finance sector is indicated in Table 3 and Figure 4. Instalment sales credit extended by commercial banks has increased rapidly, especially since World War II. As can be determined from Table 3, they held 40 per cent of this paper in 1963 as compared with 22 per cent in 1940.

In recent years credit unions, among the "other financial institutions," have also shown considerable growth in sales financing activity. Their aggregate growth is limited by the basic principles of their operation; they are cooperative ventures whose consumer instalment sales credit customers must be members and whose members must be eligible by virtue of their business, fraternal, or some such status.

TABLE 3

CONSUMER INSTAIMENT SALES CREDIT OUTSTANDING BY HOLDER
(Millions of Dollars)

End of Period	Consumer Instalment Paper Held by														
	All Holders			Commercial Banks			Sales Finance Companies			Other Financial Institutions			Retail Outlets	Automobile Dealers
	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Other Consumer Goods	Automobiles
1919	304	409	713	2	.....	2	42	31	73	2	...	2	378	258
1920	376	490	866	4	.....	4	61	44	105	2	...	2	446	309
1921	317	484	801	6	.....	6	54	39	93	2	...	2	445	255
1922	295	619	914	8	1	9	86	50	136	2	...	2	568	199
1923	526	684	1,210	10	3	13	164	58	222	4	...	4	623	348
1924	670	779	1,449	14	5	19	215	78	293	6	...	6	696	435
1925	914	951	1,865	19	8	27	402	127	529	9	...	9	816	484
1926	977	1,083	2,060	24	10	34	501	168	669	12	1	13	904	440
1927	765	1,183	1,948	29	10	39	445	183	628	15	1	16	989	276
1928	1,134	1,331	2,465	35	12	47	572	244	816	19	1	20	1,074	508
1929	1,384	1,544	2,928	40	13	53	736	337	1,073	22	1	23	1,193	586
1930	986	1,432	2,418	42	13	55	568	309	877	24	3	27	1,107	352
1931	684	1,214	1,898	39	12	51	432	243	675	22	6	28	953	191
1932	356	834	1,190	31	10	41	259	146	405	22	8	30	670	44
1933	493	799	1,292	38	11	49	368	122	490	22	9	31	657	65
1934	614	889	1,503	52	16	68	477	123	600	28	11	39	739	57
1935	992	1,000	1,992	78	30	108	770	111	881	34	12	46	847	110
1936	1,372	1,290	2,662	155	77	232	1,077	126	1,203	44	16	60	1,071	96

TABLE 3 (Continued)

End of Period	Consumer Instalment Paper held by													
	All Holders			Commercial Banks			Sales Finance Companies			Other Financial Institutions			Retail Outlets	Auto-mobile Dealers
	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Other Consumer Goods	Automobiles
1937	1,494	1,505	2,999	227	112	339	1,120	156	1,276	54	16	70	1,221	93
1938	1,099	1,442	2,541	239	125	364	707	114	821	63	21	84	1,182	90
1939	1,497	1,620	3,117	415	166	581	878	115	993	81	24	105	1,315	123
1940	2,071	1,827	3,898	615	232	847	1,187	136	1,323	102	30	132	1,429	167
1941	2,458	1,929	4,387	785	309	1,094	1,363	167	1,530	122	36	158	1,417	188
1942	742	1,195	1,937	282	153	436	341	78	419	65	27	92	937	53
1943	355	819	1,174	144	76	220	131	34	165	49	17	66	692	31
1944	397	791	1,188	160	87	247	153	28	181	51	19	70	657	33
1945	455	816	1,271	209	114	323	164	24	188	54	20	74	658	28
1946	981	1,290	2,271	480	299	779	377	67	444	77	34	111	890	47
1947	1,924	2,143	4,067	891	550	1,441	802	185	987	130	69	199	1,339	101
1948	3,018	2,901	5,919	1,328	794	2,122	1,333	287	1,620	198	103	301	1,717	159
1949	4,555	3,706	8,261	1,795	1,016	2,811	2,265	447	2,712	259	146	405	2,097	236
1950	6,074	4,799	10,873	2,471	1,456	3,927	2,956	532	3,488	360	200	560	2,611	287
1951	5,972	4,880	10,852	2,446	1,315	3,761	2,863	452	3,315	373	233	606	2,880	290
1952	7,733	6,174	13,907	3,262	1,751	5,013	3,630	680	4,310	452	310	762	3,433	389
1953	9,835	6,779	16,614	4,082	2,078	6,160	4,688	816	5,504	538	370	908	3,515	527
1954	9,809	6,751	16,560	3,937	1,880	5,817	4,870	841	5,711	539	375	914	3,655	463
1955	13,460	7,641	21,101	5,305	2,042	7,347	6,905	1,048	7,953	763	530	1,293	4,021	487
1956	14,420	8,606	23,026	5,726	2,464	8,190	7,238	1,277	8,515	954	624	1,578	4,241	502

TABLE 3 (Continued)

End of Period	Consumer Instalment Paper Held by														
	All Holders			Commercial Banks			Sales Finance Companies			Other Financial Institutions			Retail Outlets	Automobile Dealers
	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Automobiles	Other Consumer Goods	Total	Other Consumer Goods	Automobiles
1957	15,340	8,844	24,184	6,355	2,557	8,912	7,393	1,509	8,902	1,114	588	1,702	4,190	478
1958	14,152	9,028	23,180	6,184	2,269	8,453	6,310	1,717	8,027	1,152	565	1,717	4,477	506
1959	16,420	10,630	27,050	7,352	2,640	9,992	7,187	2,114	9,301	1,400	681	2,081	5,195	481
1960	17,688	11,525	29,213	8,136	2,759	10,895	7,528	2,739	10,267	1,665	771	2,436	5,256	359
1961	17,223	11,857	29,080	8,251	2,761	11,012	6,811	3,100	9,911	1,819	743	2,562	5,253	342
1962	19,540	12,605	32,145	9,635	2,824	12,459	7,449	3,123	10,572	2,111	751	2,862	5,907	345
1963	22,199	13,766	35,965	11,249	3,123	14,372	8,228	3,383	11,611	2,394	835	3,229	6,425	328

Source: U.S. Board of Governors of the Federal Reserve System, Consumer Credit Statistics, February 1963, for 1919 through 1961. Federal Reserve Bulletin, appropriate issues for 1962 and 1963.

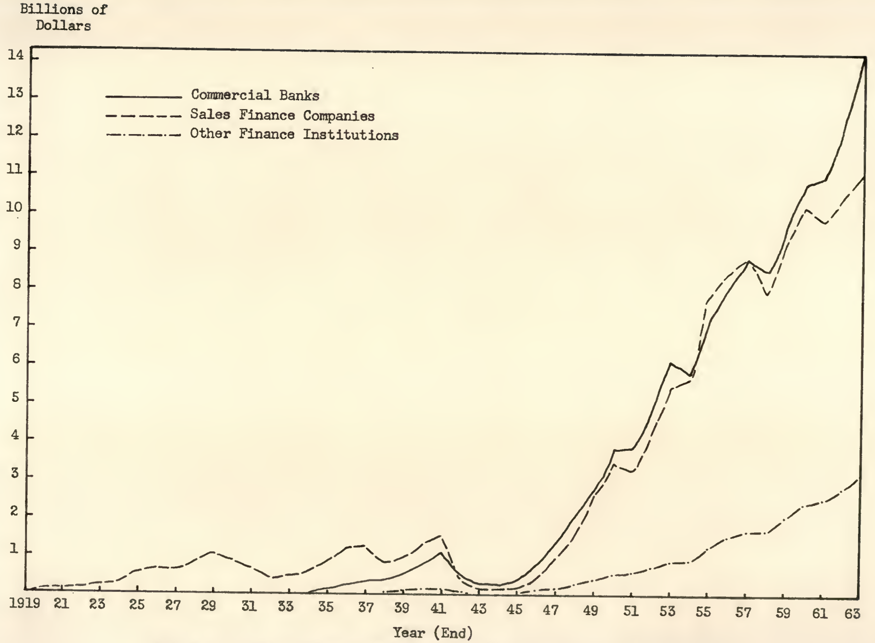

Figure 4.--Total Consumer Instalment Sales Credit Outstanding by Holder.

Major Suppliers of Credit

Quantitative comparisons of the participation of the major suppliers of consumer instalment sales credit can be made from the data in Table 3 or in Figure 4. Commercial banks and sales finance companies clearly have the lion's share. Neither of these two major groups are composed of homogeneous institutions, however.

As described previously, sales finance companies have developed on a nationwide scale, but there are many regional or local organizations. A wide variation in size exists among all sales finance companies. The scope of their operations varies essentially as a result of the difference in size (viewed as assets or loans outstanding), or, conversely, their size depends on the established pattern of their operations. The moderate and small size companies will very likely be regional and local, respectively, in coverage, whereas the largest are national in scope.

The position of commercial banks as a group in the sales finance field has grown to one of pre-eminence. Consumer credit is still a modest part of the banking business, however, and the aggressiveness and interest with which an individual bank approaches this area and its resulting involvement may accordingly vary considerably, depending upon its size, location (whether city or county, basically, but with extensive economic and geographic differences beyond that), prior commitments, and banking policy.

Although retail outlets do hold a major proportion of the "Other Consumer Goods" paper, much of this is for semidurable or soft goods and often the instalment payments are toward a "revolving charge account" rather than for a specific purchase. Therefore, they occupy no major position in the consideration of instalment sales credit for consumers' durables.

The category "Other Financial Institutions" includes such participants as industrial loan companies and mutual savings banks, as well as credit unions. The last group mentioned is probably the third largest institution in the field of sales finance. The total sales finance paper held by all "Other Financial Institutions" is less than 10 per cent of all such paper outstanding, so it can be concluded that credit unions or industrial loan companies or mutual savings banks do not as yet compare quantitatively with commercial banks and sales finance companies as major suppliers. The unique characteristics and growing influence of credit unions, however, warrant their further consideration in this chapter.

Legal Control and Regulation of Suppliers

Some basic differences between the suppliers of consumer instalment sales credit result from the legal controls and regulations which are applicable. These differences particularly bear upon the lenders' supply of funds. Commercial banks which are members of the Federal Reserve System are subject to the regulations of that body governing their operations. An important feature of their regulation is the use of reserve requirements. Although changes in these requirements are executed with caution, it is possible for the Federal Reserve authorities to exercise considerable control over all forms of bank credit by raising or lowering the percentage of deposits which must be held on reserve. Capable of finer adjustment, and thus more frequently used than the powerful tool of reserve ratios, the other quantitative instruments of monetary policy, open market operations and discount rate, play an important role in influencing the availability of credit in all commercial banks. This influence is transmitted from the banking system to all segments of the credit structure. As restrictions are implemented by Federal Reserve Board action, borrowers who are forced to shift from bank to other forms of borrowing create greater demand and thus a tighter credit situation in the nonbank areas. Therefore, even though a sales finance company can switch its borrowing from banks to private sources and from short-term to long-term, these switches will precipitate tighter conditions on the part of other lenders. At the same time, continuance of the open-market selling, which has brought about the initial tightness, will absorb some of these private lenders' available funds also. A policy of ease could, *ceteris paribus*, encourage a reversal of this action. With funds more readily available, borrowers may shift from one source of supply to another if the second presents easier terms, and the excess supply then left in the first source must cause a downward shift in the price.

In addition to the controls which the Federal Reserve System exerts over its member banks, all commercial banks are subject to state or national, statutory or legislative provisions which limit the scope of their operations. Notable among these is the limitation of the size of loan to any one borrower. This sets a ceiling on the line of credit a bank may offer to sales finance companies, promoting the impersonal relationship mentioned above which exists particularly in the case of the largest borrowers.

Sales finance companies, on the other hand, operate under no substantial direct regulations or controls, and the responsibility of their management to the owners and the general public is generally the same as that of any other business organization.

Credit unions are limited in their operations by legal restrictions. The scope of these restrictions as applied to Federal Credit Unions can be shown by the following excerpts from the Federal Credit Union Act Amendment of 1959:

> Section 8. A Federal Credit Union shall have succession in its corporate name during its existence and shall have power . . .
> (5) to make loans with maturities not exceeding five years to its members for provident or productive purposes upon such terms and conditions as this act and its bylaws provide and as the credit committee or loan officer may approve, at rates of interest not exceeding 1 per centum per month on unpaid balances, inclusive of all charges incident to making the loan; . . . . Loans shall be paid or amortized in accordance with rules and regulations prescribed by the Director [of the Bureau of Federal Credit Unions]. . . .
> (7) to invest its funds (A) in loans exclusively to members; (B) in obligations of the United States of America, . . . (C) in accordance with rules and regulations prescribed by the Director, in loans to other credit unions . . . or, (D) in shares or accounts of savings and loan associations, the accounts of which are insured by the Federal Savings and Loan Insurance Corporation; . . . .
> (9) to borrow, in accordance with such rules and regulations as may be prescribed by the Director, ...
>
> Section 15. . . . No loan shall be made to any member which causes such member to become indebted to the Federal Credit Union . . . in excess of $200 or 10 per centum of the credit union's paid-in unimpaired capital and surplus, whichever is greater, or in excess of $750 unless such excess over $750 is adequately secured. . . .
>
> Section 17. All entrance fees and charges provided by the bylaws and 20 per centum of the net earnings of each dividend period,

> before the declaration of any dividends, shall be set aside as a regular reserve. . . .[1]

A similar set of regulations generally applies to a state-chartered credit union.[2]

Sources of Lenders' Funds

Associated with the differentiations among the suppliers of instalment sales credit are the various methods these financial organizations have at their disposal for obtaining their capital funds. For some there may be numerous potential sources. Sales finance companies employ varying percentages of equity funds, short-term liabilities and long-term debt obtained from owners' capital investments, borrowings using commercial paper or debentures, and direct loans from commercial banks.[3] The latter avenue is used as the need for additional funds is indicated by the greater demand for credit. "Bank credit, therefore, serves as a buffer source of funds, expanding as the volume of retail instalment buying grows, contracting as it diminishes."[4] The commercial paper and other debt of large sales finance companies is often placed directly with investors such as insurance companies, pension and trust funds, and nonfinancial corporations, rather than through the normal channels in the money market,[1] although the latter avenue is also employed.

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[1] U.S. Statutes at Large, 86th Congress, 1st Session, 1959, Vol. 73, pp. 628-639.

[2] Credit Union Yearbook 1962 (Madison, Wisconsin: Credit Union National Association, 1962), p. 30.

[3] Wilbur C. Plummer and Ralph A. Young, Sales Finance Companies and Their Credit Practices (New York: National Bureau of Economic Research, 1940), p. 68.

[4] John H. Chapman and Associates, Commercial Banks and Consumer Instalment Credit (New York: National Bureau of Economic Research, 1940), p. 197.

The combination of sources of funds used will vary with the size of the company, because large companies can effect economies of scale while some methods of financing are not available to small companies. The direct placement of commercial paper, for example, may be possible only by issuing notes of large denomination (one million dollars is customary). Furthermore, floating a security issue is too costly if the total amount to be raised is small, and if the borrower is not well or widely known. Subordinated debt has become a desirable (although more costly for the smaller sales finance companies) means of expanding their sources of funds, since it is generally considered by other lenders to be part of a company's capital base in determining the amount of senior debt the borrower can obtain.[2] Bank borrowing may be somewhat favored by moderate size sales finance companies because the size of their requirements permits them to develop a personal relationship with one bank, whereas the larger companies must spread their greater requirements over a number of such sources and, therefore, approach this area of finance on an impersonal basis in order to keep all avenues open.[1] The smallest companies represent a somewhat greater risk due to lack of diversification and, therefore, do not warrant as sizeable a line of credit, on a percentage basis.

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[1] Federal Reserve Board, Consumer Instalment Credit, Paet I, Vol. 1, p. 273.

[2] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 22-23.

In contrast, commercial banks obtain a relatively small amount of their funds from equity financing compared to their large deposit liabilities, and only recently have they embarked upon the sale of long- and short-term debt instruments for financing (aside from Federal Reserve borrowing). These new sources of funds, in the form of bonds, negotiable time certificates of deposit (CD's) and unsecured notes, are used primarily by the larger banks, although the practice is spreading to many medium-size and small banks. The banking system as a whole influences the level of bank deposits by the amount of credit it extends, within the limitations imposed by the instruments of monetary policy. Any one bank can influence its own deposit liabilities primarily by its promotion efforts and through its reputation. In the aggregate, the variations in this important source of funds (deposits) are due to competition, seasonal variations, runs, long-term shifts, business cycle fluctuations, and monetary policy.

Credit unions occupy a unique position among the suppliers of consumer instalment sales credit. They have primarily a single aggregate source of funds. This is comprised of the savings of the employees of the organization which the credit union services. Any small amount of borrowing which they do is usually from another credit union.[1]

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 74-75.

Monetary Policy and the Availability of Consumer Instalment Sales Credit

The important role played by commercial banks in the consumer sales finance field provides a basis for considering the direct impact of Federal Reserve action on the volume of consumer instalment sales credit. Accommodating or restricting the credit-granting operations of member banks will influence their direct loans to consumers, the availability of funds they supply to sales finance companies, and credit for production which eventually will have its effect on the funds of credit unions. Although a lag in the response of consumer instalment sales credit extensions and repayments to monetary policy and something less than complete correlation is to be expected, the possibility of a discernible relationship does loom large.

The basis for this relationship is the ability of the Federal Reserve to restrict the amount of deposit liabilities in particular and the total assets of banks in general. In December 1963 the total assets of commercial banks amounted to $313 billion. Deposits were $275 billion. These accounted for 88 per cent of the total assets. Loans were $156 billion or 50 per cent of total assets.

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[1] Ernst A. Dauer, Comparative Operating Experience of Consumer Instalment Financing Agencies and Commercial Banks, 1929-41 (New York: National Bureau of Economic Research, 1944), p. 40.

The implementation of monetary policy by the Federal Reserve has a direct effect on the extension of credit by the banking system. Under tight money conditions a bank endeavors to provide for the needs of its regular business customers while tending to restrict those areas of their lending operations which are individually less important and more impersonal. Since the long-term growth of a commercial bank rests upon its ability to attract and hold deposits, this source of funds in itself lends some direction to a bank's policies in a tightening money situation. Nondepositors, sellers of commercial paper, and other applicants who are not regular customers command a lower priority. Banks feel the influence of the market for loanable fund especially in a period of slower growth of bank reserves and demand deposits and tightening credit. When the question of selling U.S. government securities in order to obtain funds with which to meet loan demands arises, a noticeable tightening of all forms of bank credit will result.[1]

An individual bank establishes its loan-deposit ratio based on the type of customer-depositor it serves. A large proportion of time deposits, for example, would permit a reasonably higher-loan-deposit ratio because of the greater stability of the funds and the lower required reserves. In attempting to maintain a desired loan-deposit ratio, moreover, individual banks may vary their approach based on differing policies. Loans may vary due to seasonal fluctuations, instability in the area, or the bank's requirement to maintain liquidity.[1] The long-run goal of building deposits by loaning to customers who will contribute to them must be balanced against the more immediate desire to show good profitability by employing its funds judiciously and so serve the community.

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 1, pp. 265-267.

Commercial banks' sales finance operations must conform to their pattern of operations in general. Loans made to consumers directly and through the agency of a retailer must have been judged, individually, creditworthy by banking standards, must not exceed the share of the bank's loan portfolio allocated for this purpose. Consumer sales finance loans provide a good return and have a favorable repayment record. They rank above home mortgage loans on these counts. The amount of consumer credit granted will be dependent upon all these variables as they are determined by the individual bank's policies and the current climate of monetary policy.

Sales finance companies from their inception have relied on bank loans as a source of funds. Some are regular customers, who will be accommodated when others may be restricted. Accordingly, they are not pressed to restrict consumer loans in the early stages of a tight money period. Since the cost of borrowing is not a major part of their total operating expense, they are able to pursue a policy of relatively stable finance charges for their customers. This they prefer to do even though it sometimes reduces their profit margin.

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[1] Roland I. Robinson, The Management of Bank Funds (New York: McGraw-Hill Book Company, 1951), pp. 25-40.

As a tight money policy continues, the ability of sales finance companies to obtain funds from other than bank sources allows them to continue to provide sufficient funds for the needs of their customers, unless requirements become excessively large and the tight money period is unusually long, in which case the pervasive high interest rates and tight money will affect all sources. As in any business, marginal operators will be hit first, of course, and generally the smaller sales finance companies will feel the credit stringencies before the larger.

Credit unions obtain their funds almost entirely from the deposits of shares of members. These institutions have little direct relationship to areas affected by credit control measures of the Federal Reserve, but a causal connection does exist. As the effects of a tight money policy pervade the economy, the expansion in industrial production is curtailed, thus restricting the rate of growth of the funds of credit unions operating in this area. Only in periods of contraction in the economy will funds available for credit unions be reduced. Such periods probably coincide rather closely with a reduction in the demand for consumer loans for the purchase of durables by members of the credit unions, although the reduction in demand, as measured by loans outstanding, may lag behind the reduction in credit union shares. It is thus possible that credit unions may experience temporary tight credit situations.

Monetary Policy, 1946-1963

Graphic evidence of "tight" or "easy" monetary policy during the postwar period is presented in Figure 5. Until the accord of 1951, no substantive action by the Board of Governors of the Federal Reserve System directed toward the implementation of its own policy determinations was possible. In 1952, having regained their freedom of action, the Board moved to restrain the growing boom in the economy. This culminated in the first "tight money" period of the postwar era. In the middle of 1953 monetary policy was eased as a mild recession, brought on to a great extent by the reduction in federal defense spending, ensued. In the second half of 1955 a period of tight money began which continued through the boom period until late in 1957. Since prices continued to rise in the recession which was under way by then, the Board was slow to release the restraints.

The following short, low-amplitude cycle, with a peak in 1959 and a trough in 1960, was accompanied by appropriate tight and easy money periods. By this time gold outflows were reaching troublesome proportions, and action was taken toward maintaining short-term interest rates at a sufficiently high level to provide for the retention of short-term funds in this country. As the recovery progressed in 1962, the emphasis on economic growth appeared to have exercised some depressive influence on long-term interest rate policy. During 1963, however, some evidences of moderate restraint appeared.[1]

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[1] See Henry C. Wallich and Stephen H. Axilrod, "Postwar United States Monetary Policy Reappraised," in The American Assembly, United States Monetary Policy (Rev. ed.; New York: Frederick A. Praeger, 1964), pp. 116-136.

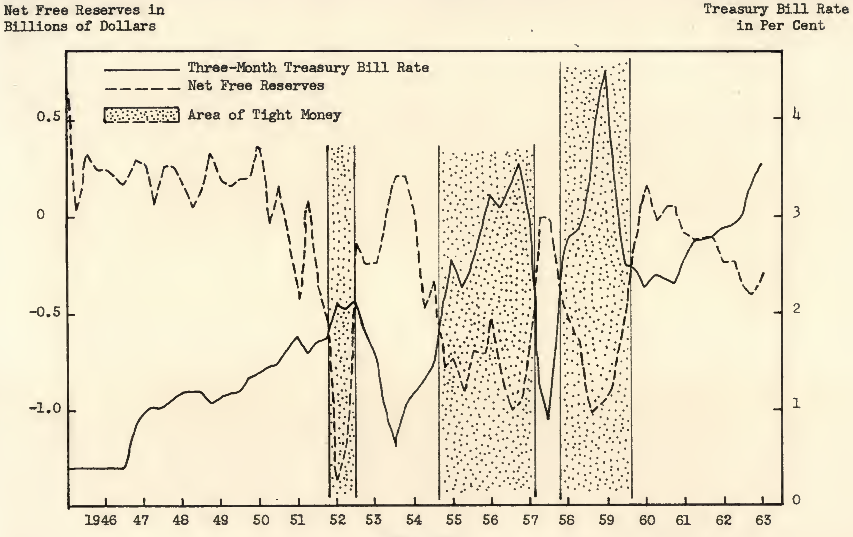

Figure 5.--Monetary Policy, 1946-1963.

Source: U.S. Board of Governors of the Federal Reserve System.

Effect of Extensions and Repayments

Consumer instalment sales credit extended and repaid are related to the variations in monetary policy in Figures 6 and 7. The credit series are shown after removal of the linear trend component by a regression against time. The time factor shows a high degree of correlation ($R^2 = .977$ for extensions and $R^2 = .994$ for repayments) with each of the credit variables. This indicates that the pattern of their upward movement appears to be distributed about a straight line. The removal of these trend components provides residual values which can properly be studied as a basis for considering the relationship between instalment credit and monetary policy, aside from the normal growth of the credit variables.

It can be noted at the outset that repayments show much less fluctuation from trend than extensions due to the nature of instalment credit. Repayments represent the same dollar volume as extensions (except for defaults) but each extension enters the aggregate volume of extensions as a lump sum, while its counterpart in repayments enters the aggregate volume of repayments as a series of smaller amounts. Thus, the relationship to monetary policy will be viewed mostly from the standpoint of the change in extensions. One other inherent characteristic of repayments, of course, is their normal tendency to lag behind extensions in the occurrence of peaks and troughs. The lag will vary, depending on the length of time allowed for repayment at the time credit was extended. This will also affect the range of fluctuations, since the longer the time allowed for maturity, the less pronounced

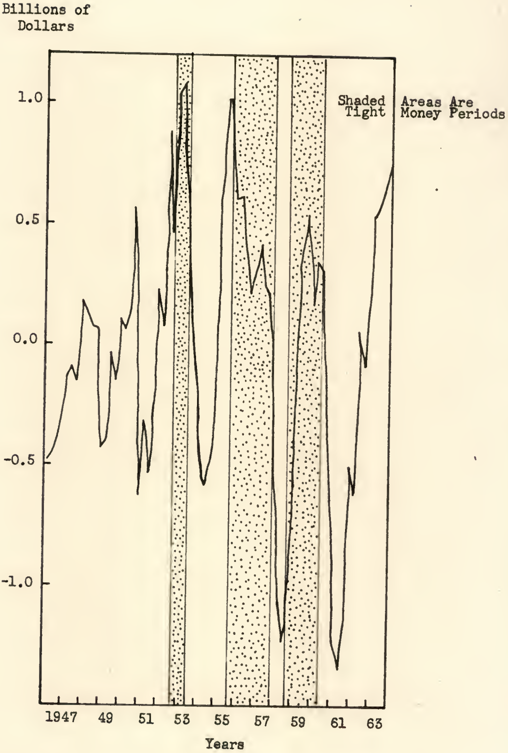

Figure 6.--Extensions of Consumer Instalment Sales Credit (Trend Removed).

Source: U.S. Board of Governors of the Federal Reserve System.

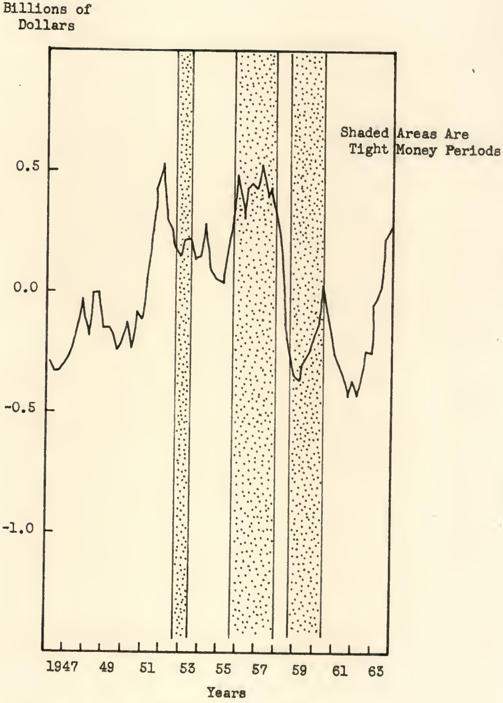

Figure 7.--Repayments of Consumer Instalment Sales Credit (Trend Removed).

Source: U.S. Board of Governors of the Federal Reserve System.

will be the repayment series' reproduction of the extension series' peaks and troughs. These variations in the repayment series can have a significant effect on the economy by virtue of the shifts in point of impact which result.

General economic conditions have played a major role in the pattern of credit fluctuations. Post World War II production of consumers' durables was limited at the outset due to problems of reconversion. The expansion of consumer instalment sales credit was less than expected because of these same reconversion problems and for two other reasons. The first was the continued imposition of Regulation W, and the second was the high proportion of buyers able to pay cash. In October of 1947 Regulation W was terminated and credit extensions advanced beyond a normal upward trend. After a dip occasioned by the reimposition of Regulation W in September of 1948, sales finance quickly recovered when the restrictions were once again lifted and began a rapid climb, despite the recession of 1949.[1] This rise was spurred on in the second quarter of 1950 beyond the normal trend by the "scare" buying attending the start of the Korean conflict. The restrictions of Regulation W were once more reimposed in September of 1950. This condition once again reversed the upward movement as the Korean War continued. In May of 1952 the Federal Reserve Board suspended Regulation W, and the immediate rise of instalment sales credit responded to the expansion of the economy then in process.[2]

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[1] Controls were eased early in March of 1949 by the Federal Reserve Board, eased further in April 1949, and allowed to expire at the end of June 1949.

[2] Regulation W as a standby measure expired in June 1952.

From this point on, extensions follow a pattern attuned to monetary policy and other influential economic conditions. Repayments predictably lag with little deviation from the prior movement in extensions except for less volatility and a narrower range. The imposition of monetary stringency in 1952-53 appears to have been well timed, with respect to consumer instalment sales credit extensions. The record automobile sales in 1955 contributed to a steep climb in extensions before a tight monetary policy was invoked. The lag in the repayments series resulted in the peak in this countercyclical variable occurring within the tight-money period.

As monetary policy continued to follow the course suggested by business cycle indicators, credit extended, while conditioned by the public's need of and desire for durables, reacted as would be expected. The lag in the repayment series caused its trough to fall early in the tight-money period of 1958-60, but its peak appropriately occurred just as monetary policy was easing. The peaks of 1958-59 in both series were much lower than those previously attained. This may be attributed to the overbuying and overextending of 1955 along with the short time between peaks.

Sales finance appears to respond to economic factors in general, but its relationship to any one in particular, such as monetary policy action, requires further evaluation. Its supply, while subject to limitations by the pervasive influence of monetary policy, appears to have been sufficiently flexible to meet increased demand in the past without serious difficulty. The fact that extensions may remain at a relatively high level when tight monetary policy has been in effect for some time may reflect the ability of suppliers to obtain some funds from sources beyond the immediate initial influence of the central banks, and their ability and/or willingness to direct a larger proportion of available funds to instalment sales lending. It is not possible to judge what the expansion of consumer instalment sales credit would have been without the influence of monetary policy, of course. A statistical analysis can give some indication of the quantitative effect of monetary policy on this area viewed along with the other appropriate variables.

Effect on Share of the Market

Consumer instalment sales credit held by commercial banks and sales finance companies in the postwar period is shown in Table 4. Although the banks have slowly increased their share of the market over this whole period, sales finance companies starting with a much lower portion, have increased their holdings to a percentage close to that of the banks. This has been at the expense of other holders of sales finance paper, particularly retailers. Since 1949, commercial banks and sales finance companies have each averaged a little more than a one-third share of the market as suppliers of instalment sales finance. The commercial banks' share has fluctuated over a range of 34.7 to 40.7 per cent in this period. While sales finance companies have usually held a slightly lower percentage, their variation has been greater, from 30.3 to 38.5 per cent. This contrast may be due to the fact that the higher credit standards and greater diversification

TABLE 4

SHARES OF THE MARKET OF MAJOR SALES FINANCE SUPPLIERS
(Sales Finance Credit Outstanding)

Year	Quarter	Total	Held by Sales Finance Companies		Held by Commercial Banks	
		Millions of Dollars	Millions of Dollars	Per Cent	Millions of Dollars	Per Cent
1946	1	1,338	217	16.2	390	29.1
	2	1,583	275	17.4	514	32.5
	3	1,821	349	19.2	632	34.7
	4	2,271	444	19.6	779	34.3
1947	1	2,569	565	22.0	950	37.0
	2	3,055	715	23.4	1,150	37.6
	3	3,365	824	24.5	1,266	37.6
	4	4,067	987	24.3	1,441	35.4
1948	1	4,450	1,179	26.5	1,641	36.9
	2	5,009	1,373	27.4	1,857	37.1
	3	5,551	1,561	28.1	2,058	37.1
	4	5,919	1,620	27.4	2,122	35.8
1949	1	5,952	1,755	29.5	2,146	36.1
	2	6,661	2,119	31.8	2,375	35.7
	3	7,362	2,479	33.7	2,592	35.2
	4	8,261	2,712	32.8	2,811	34.0
1950	1	8,558	2,868	33.5	3,011	35.2
	2	9,508	3,225	33.9	3,414	35.9
	3	10,737	3,610	33.6	3,948	36.8
	4	10,873	3,488	33.1	3,927	36.1
1951	1	10,466	3,304	31.6	3,850	36.8
	2	10,389	3,323	32.0	3,844	37.0
	3	10,546	3,424	32.5	3,786	35.9
	4	10,852	3,315	30.5	3,761	34.7
1952	1	10,471	3,169	30.3	3,740	35.7
	2	11,663	3,614	31.0	4,215	36.1
	3	12,455	3,873	31.1	4,541	36.5
	4	13,907	4,310	31.0	5,013	36.0
1953	1	14,497	4,631	31.9	5,484	37.8
	2	15,528	5,052	32.5	5,978	38.5
	3	16,151	5,409	33.5	6,180	38.3
	4	16,614	5,504	33.1	6,160	37.1

TABLE 4 (Continued)

Year	Quarter	Total	Held by Sales Finance Companies		Held by Commercial Banks	
		Millions of Dollars	Millions of Dollars	Per Cent	Millions of Dollars	Per Cent
1954	1	15,734	5,248	33.4	5,874	37.3
	2	15,865	5,382	33.9	5,879	37.1
	3	15,999	5,594	35.0	5,810	36.3
	4	16,560	5,711	34.5	5,817	35.1
1955	1	16,964	6,042	35.6	6,075	35.8
	2	18,564	6,873	37.0	6,636	35.7
	3	20,036	7,710	38.5	7,104	35.5
	4	21,101	7,953	37.7	7,347	34.8
1956	1	21,118	8,019	38.0	7,506	35.5
	2	21,863	8,237	37.7	7,991	36.6
	3	22,330	8,436	37.8	8,081	36.2
	4	23,026	8,515	37.0	8,190	35.6
1957	1	22,620	8,453	37.4	8,227	36.4
	2	23,318	8,683	37.2	8,676	37.2
	3	23,782	8,960	37.7	8,900	37.4
	4	24,184	8,902	36.8	8,912	36.9
1958	1	23,054	8,603	37.3	8,538	37.0
	2	22,853	8,415	36.8	8,593	37.6
	3	22,689	8,199	36.1	8,411	37.1
	4	23,180	8,027	34.6	8,453	36.5
1959	1	23,222	8,047	34.7	8,712	37.5
	2	24,641	8,593	34.9	9,343	37.9
	3	25,959	9,159	35.3	9,836	37.9
	4	27,050	9,301	34.4	9,992	36.9
1960	1	27,050	9,590	35.5	10,205	37.7
	2	28,228	10,051	35.6	10,728	38.0
	3	28,663	10,296	35.9	10,903	38.0
	4	29,213	10,267	35.1	10,895	37.3
1961	1	28,129	9,962	35.4	11,425	40.6
	2	28,216	9,906	35.1	11,231	39.8
	3	28,189	9,809	34.8	11,011	39.1
	4	29,080	9,911	34.1	11,012	37.9

TABLE 4 (Continued)

Year	Quarter	Total	Held by Sales Finance Companies		Held by Commercial Banks	
		Millions of Dollars	Millions of Dollars	Per Cent	Millions of Dollars	Per Cent
1962	1	28,647	9,906	34.6	11,078	38.7
	2	30,046	10,119	33.7	11,768	39.2
	3	30,663	10,253	33.4	12,037	39.3
	4	32,145	10,572	32.9	12,459	38.8
1963	1	32,079	10,821	33.7	12,844	40.0
	2	33,658	11,003	32.7	13,691	40.7
	3	34,427	11,256	32.7	14,008	40.7
	4	35,965	11,611	32.3	14,372	40.0

Source: U.S. Board of Governors of the Federal Reserve System, *Consumer Credit Statistics*, February 1963, for 1946 through 1961. *Federal Reserve Bulletin*, appropriate issues for 1962 and 1963.

of the commercial banks lend greater stability to their participation in the growth of the sector or it may reflect their more stable source of funds. For example, their increase from the third quarter of 1960 to the first quarter of 1961 was $522 million and their increase from the first quarter of 1960 to the second quarter of 1960 was $523 million. The former represented an increase of 2.6 per cent of the market, while the latter was only 0.3 per cent. The former occurred in a recessionary period when the total amount of sales finance credit outstanding was declining. The position of sales finance companies in the market for consumer instalment sales credit declined by 0.5 per cent of the total at the same time. The first-to-second-quarter change in 1960, on the other hand, was part of a general rise in credit outstanding, participated in by the sales finance companies also.

Although the fourth quarter of the year almost invariably shows a decline in the percentage held by both commercial banks and sales finance companies, this is primarily the result of a seasonal increase in total sales finance instalment credit, much of which is held by retailers.

The greater stability of bank participation is first noted in the 1950 to early 1952 period in which the sales finance companies' share of the market fell from 33.9 to 30.3 per cent. During the same period the share of commercial banks varied from 37.0 to 35.7 per cent. For the tight money period which followed, the change in shares was similar for both.

The third quarter of 1953 shows the contrast once again as sales finance companies increased their share of the market substantially in an atmosphere of monetary ease, while commercial banks decreased slightly. The same was true in the third quarter of 1954. In the boom of 1955 the tight money situation had no immediate effect, and the third quarter once again showed sales finance companies making substantial gains in their share to 38.5 per cent while banks slipped slightly to 35.5 per cent.

As the tight money conditions continued, the share of sales finance companies declined and the share of banks rose. At the end of the tight money period, early in 1958, commercial banks were leading once again with 37.6 per cent, compared to 36.8 per cent for sales finance companies. During the short period of ease and the resumption of tight money which followed there was little change in their relative positions in regard to shares of the market. A jump in the banks' share occurred in the easy money period of 1961 and during 1962 and 1963 this gain, mostly at the expense of the sales finance companies' share, continued. The events of the last three years appears to be a structural change in which commercial banks now command a larger share of this market as a result of their advertising and promotional efforts.

Effect on Supply of Funds

Sales finance companies may be able to avoid the immediate impact of Federal Reserve action by availing themselves of their multiple sources of financing. Tables 5, 6, 7, and 8 provide the liability sides of composite balance sheets for sales finance companies in the United States. The two dates for which the data are available represent diverse periods in the business cycle. Any differences, therefore, may be due to some extent to cyclical fluctuations as well as structural change.

Comparing the two periods in Table 7, it can be seen that the item "notes payable to banks" has decreased considerably in the five-year period. Compensating for (or accounting for) most of this decrease has been the increase in long-term debt. While "total liabilities and capital" was rising 61 per cent and long-term debt increased 88 per cent, short-term debt increased only 39 per cent. In particular, "notes payable to banks" increased only 14 per cent while subordinated debentures more than doubled.

Some comparisons by size of companies can be made from Table 8. The largest companies decreased their reliance on bank credit by about 20 per cent through the reduction in their short-term notes. The increase in subordinated debentures and other long-term debt essentially corresponds to the decrease in bank credit.

The middle-size companies, starting with a much higher percentage base, decreased their reliance on bank credit by about 20 per cent also. Although a small rise in subordinated debentures took place, most of the matching increase occurred in capital and surplus.

The smallest companies show the greatest drop in bank credit, more than 25 per cent in short-term notes. This was slightly offset by a small increase in long-term bank debt. Part of this decrease was

TABLE 5

SOURCES OF FUNDS, ALL SALES FINANCE COMPANIES, BY SIZE OF COMPANY, PER CENT DISTRIBUTION, 1960
(As of June 30)

Type of Source	Size of Company (Consumer Loans Outstanding in Thousands of Dollars)								
	100,000 and over	25,000 to 99,000	5,000 to 24,999	2,500 to 4,999	1,000 to 2,499	500 to 999	250 to 499	100 to 249	Under 100
Short-term notes payable to banks	12.8	33.9	40.8	32.4	28.1	24.6	21.9	17.3	8.7
Commercial paper and other short-term notes	27.7	15.9	7.5	10.2	11.4	8.4	10.4	8.5	4.8
Other current liabilities	6.1	10.1	6.9	16.2	8.1	9.1	7.7	6.4	3.2
Long-term notes payable to banks	1.7	3.3	2.7	2.8	6.7	5.6	5.6	2.9	3.6
Subordinated debentures	10.0	8.6	8.3	10.0	8.1	5.2	3.3	3.3	2.0
Other long-term indebtedness	30.7	13.6	7.5	1.6	7.8	6.4	7.5	8.1	5.1
Other liabilities	....	1.5	3.0	6.7	4.4	4.0	4.4	3.8	2.1
Capital and surplus	11.0	13.1	23.3	20.1	25.4	36.7	39.2	49.7	70.5

Source: *Federal Reserve Bulletin*, Vol. 47 (October, 1961), p. 1160.

.... Indicates zero or less than 0.5 of 1 per cent.

TABLE 6

SOURCES OF FUNDS, ALL SALES FINANCE COMPANIES, BY SIZE OF COMPANY, PER CENT DISTRIBUTION, 1955
(As of June 30)

Type of Source	Size of Company (Consumer Loans Outstanding in Thousands of Dollars)					
	25,000 and over	5,000 to 24,999	1,000 to 4,999	500 to 999	100 to 499	Under 100
Short-term notes payable to banks	19.0	50.3	44.4	34.5	22.0	14.2
Commercial paper and other short-term notes	27.4	9.1	14.0	13.6	8.7	4.2
Other current liabilities	a	a	a	a	a	a
Long-term notes payable to banks	1.7	2.8	2.7	5.6	5.0	10.0
Subordinated debentures	8.4	6.7	5.5	2.9	3.7	0.8
Other long-term indebtedness	27.6	8.5	4.7	5.1	12.4	18.3
Other liabilities	4.7	5.0	6.6	8.3	8.4	6.7
Capital and surplus	11.2	16.5	22.1	30.0	39.8	45.8

Source: Federal Reserve Bulletin, Vol. 43 (April, 1957), p. 408.

[a] "Other current liabilities" not shown as a separate category in 1955.

TABLE 7

SOURCES OF FUNDS, ALL SALES FINANCE COMPANIES, 1960 and 1955
(As of June 30)

Type of Source	Millions of Dollars		Per Cent	
	1960	1955	1960	1955
Short-Term				
Notes payable to banks	$ 2,875	$ 2,521	18	25
Commercial paper and other short-term notes	3,866	2,317[a]	24	23[a]
Total	$ 6,741	$ 4,838[a]	42	48[a]
Other current liabilities	1,120	531[a]	7	5[a]
Long-Term				
Notes payable to banks	353	230	2	2
Subordinated debentures	1,548	758	9	8
Other long-term debt	4,149	2,222	25	22
Total	$ 6,050	$ 3,210	36	32
Total debt	$12,791	$ 8,048	78	80
Other liabilities	120	.....[a]	1	..[a]
Capital and surplus	2,211	1,498	14	15
Total liabilities and capital	$16,242	$10,077	100	100

Source: Federal Reserve Bulletin, Vol. 47 (October, 1961), p. 1145.

[a] Not entirely comparable with 1960 data.

.... Indicates zero or less than 0.5 of 1 per cent or 0.5 million dollars.

NOTE.--Details may not add to totals because of rounding.

TABLE 8

SOURCES OF FUNDS, ALL SALES FINANCE COMPANIES BY SIZE OF COMPANY, 1960 and 1955
(Per Cent Distribution as of June 30)

Type of Source	$25 million and over[a]		$5-$25 million[a]		Under $5 million[a]	
	1960	1955	1960	1955	1960	1955
Short-Term						
Short-term notes payable to banks	15	19	40	50	27	37
Commercial paper and other short-term notes	27	27[b]	8	9[b]	10	13[b]
Total	42	46[b]	48	59[b]	37	50[b]
Other current liabilities	6	5[b]	7	6[b]	10	7[b]
Long-Term						
Long-term notes payable to banks	2	2	3	3	5	4
Subordinated debentures	10	8	8	7	7	4
Other long-term debt	29	28	8	8	6	7
Total	41	38	19	18	18	15
Total debt	83	84	67	77	55	65
Other liabilities	...	...[b]	3	...[b]	5	...[b]
Capital and surplus	11	11	23	17	30	28
Total liabilities and capital (millions)	$13,765	$7,309	$1,211	$ 836	$1,266	$1,932
Number of companies	34	20	87	61	1,900	2,539

Source: Federal Reserve Bulletin, Vol. 47 (October, 1961), p. 1147.

... Indicates zero or less than 0.5 of 1 per cent.

[a] Size of company is based on consumer loans.

[b] Not entirely comparable with 1960 data.

NOTE.--Details may not add to totals because of rounding.

also accounted for by a small increase in capital and surplus. Most of the compensating increase is in current and other liabilities, however. A 25 per cent mortality rate is shown for this group, some part of which may be the result of consolidation and moving into a larger size category or being acquired by a larger company.

Sample surveys of sales finance companies of all sizes provide similar data over a greater span of years, as shown in Tables 9, 10, 11, 12, and 13, and Figure 8. Trends in the methods of financing can be seen developing in the years under study. The use of long-term debt is slowly increasing due to a great extent to the experiences of sales finance companies in 1955-56 and 1953, when the banks imposed some stringencies on their borrowing.[1] Shifts from short-term to long-term debt sometimes have occurred, as would be expected, when interest rates were low, in order to keep the long-term average cost of funds at a minimum. This results in the amount of short-term borrowing often rising, on a percentage basis, in tight money periods.

Among the largest sales finance companies (over $350 million in assets) the movement toward greater use of long-term debt was primarily in the form of an abrupt jump in 1953. Short-term "notes payable" has continued the downward trend precipitated in 1953 and 1955-56. The continued growth of long-term debt has been associated with most of the decline, along with increases in some of the items which are part of "other liabilities." Income tax liability would very likely

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 112-115.

TABLE 9

SOURCES OF FUNDS, SALES FINANCE COMPANIES OF OVER $350 MILLION ASSET SIZE, SAMPLE SURVEYS

			Percentage Distribution					
			Long-Term Debt			Net Worth		
						Stock		
End of Year	Number of Companies	Notes Payable	Unsubordinated	Subordinated	Other Liabilities	Preferred	Common	Surplus
1945	4	21.0	3.6		17.6	57.8		
1946	4	41.9	9.9		19.5	28.8		
1947	4	54.6	11.5		14.6	19.3		
1948	4	49.5	23.0		10.4	17.1		
1949	4	46.6	26.6		11.7	15.2		
1950	4	47.0	26.6		12.8	13.6		
1951	4	49.3	27.2		9.9	13.7		
1952	4	53.4	24.5		9.9	12.3		
1952	4	53.4	17.3	5.5	11.5	1.3	3.6	7.4
1953	4	41.3	30.7	8.2	8.8	1.1	3.3	6.6
1954	4	35.8	30.6	9.9	12.2	0.2	3.4	7.9
1955	4	41.5	31.9	8.1	9.0	0.9	3.0	5.5
1956	4	35.7	35.2	9.0	10.5	0.9	2.9	6.0
1957	4	35.8	34.9	8.8	10.9	0.8	2.6	6.2
1958	4	28.7	39.6	10.0	9.8	0.8	3.0	8.0
1959	4	32.6	37.3	10.0	9.1	0.7	2.6	7.6
1960	4	34.4	36.3	9.9	8.8	0.6	2.9	7.2
1960	4	34.6	36.0	9.9	8.8	0.6	2.9	7.2
1961	4	27.8	34.6	13.9	12.1	0.5	3.1	8.1
1962	4	32.7	33.4	9.6	13.2	0.4	2.8	7.9

Source: See Table 13.

TABLE 10

SOURCES OF FUNDS, SALES FINANCE COMPANIES OF $50 - $349 MILLION ASSET SIZE, SAMPLE SURVEYS

End of Year	Number of Companies	Percentage Distribution						
			Long Term Debt			Net Worth		
						Stock		
		Notes Payable	Unsubordinated	Subordinated	Other Liabilities	Preferred	Common	Surplus
1945	8	57.8	2.4		10.2	29.6		
1946	8	65.0	8.5		7.0	19.5		
1947	8	66.5	8.9		7.3	17.4		
1948	8	65.7	10.3		8.2	15.8		
1949	8	64.4	10.1		8.7	16.9		
1950	8	60.8	14.2		8.8	16.1		
1951	8	63.5	12.2		8.6	15.7		
1952	8	62.4	14.8		8.4	14.4		
1952	14	58.8	9.3	8.7	8.7	2.5	5.8	6.2
1953	14	59.7	10.7	8.8	7.4	2.3	5.4	5.8
1954	14	54.9	12.5	10.3	8.0	1.9	5.6	6.7
1955	14	57.4	12.6	10.1	7.3	1.8	4.8	6.0
1955	13	57.4	13.0	9.7	7.4	1.8	4.7	6.0
1956	13	55.4	15.8	9.3	7.1	2.4	4.0	6.0
1957	13	54.8	15.5	9.8	6.9	2.3	4.0	6.7
1958	13	52.4	15.7	10.3	7.1	2.4	4.2	7.8
1959	13	52.1	17.7	9.9	7.0	2.0	3.6	7.7
1960	13	48.9	21.0	10.1	6.6	2.1	3.7	7.6
1960	12	48.5	21.3	10.1	6.6	2.0	3.7	7.7
1961	12	42.7	22.8	11.8	8.3	2.5	3.8	8.1
1961	11	43.2	22.4	11.7	8.3	2.5	3.8	8.1
1962	11	46.6	22.4	9.7	7.7	2.2	3.7	7.6

Source: See Table 13.

TABLE 11

SOURCES OF FUNDS, SALES FINANCE COMPANIES OF $10 - $49 MILLION ASSET SIZE, SAMPLE SURVEYS

			Percentage Distribution					
			Long-Term Debt			Net Worth		
						Stock		
End of Year	Number of Companies	Notes Payable	Unsubordinated	Subordinated	Other Liabilities	Preferred	Common	Surplus
1945	20	44.7	6.9		8.1	40.3		
1946	20	61.3	5.3		6.4	27.1		
1947	20	59.6	8.6		6.9	24.9		
1948	20	62.4	9.3		6.3	21.9		
1949	20	60.3	10.1		6.8	22.9		
1950	20	64.0	9.6		6.4	20.0		
1951	20	62.1	10.4		7.1	20.5		
1952	20	60.8	12.1		7.2	20.0		
1952	24	62.0	3.9	7.1	7.9	4.9	4.4	9.8
1953	24	59.2	5.6	8.3	7.1	4.7	4.5	10.5
1954	24	58.0	5.7	8.3	7.3	5.0	5.4	10.4
1955	24	59.3	7.4	9.3	6.6	4.5	4.4	8.4
1956	24	54.1	11.5	9.9	6.8	4.7	4.2	8.9
1956	24	54.2	11.5	9.9	6.8	4.7	3.8	9.1
1957	24	52.0	13.8	9.4	6.8	4.4	3.4	10.1
1957	24	51.9	13.8	9.4	6.8	4.5	3.6	10.0
1958	24	47.7	14.0	11.6	7.2	5.0	3.5	11.1
1959	24	52.1	13.0	10.1	7.3	4.5	2.9	10.2
1959	23	51.9	13.2	10.1	7.3	4.4	3.0	10.2
1960	23	47.2	17.1	11.1	6.9	4.9	2.9	10.0
1960	19	46.2	18.0	11.8	7.0	4.9	2.3	9.7
1961	19	45.8	17.2	13.0	6.6	5.4	2.3	9.9
1961	18	45.6	17.6	12.8	6.6	5.5	2.4	9.6
1962	18	46.1	18.8	11.5	7.2	5.1	2.1	9.2

Source: See Table 13.

TABLE 12

SOURCES OF FUNDS, SALES FINANCE COMPANIES
OF UNDER $10 MILLION ASSET SIZE,
SAMPLE SURVEYS

End of Year	Number of Companies	Notes Payable	Percentage Distribution					
			Long-Term Debt		Other Liabilities	Net Worth		
						Stock		
			Unsubordinated	Subordinated		Preferred	Common	Surplus
1945	8	47.7	6.4		4.6	41.3		
1946	8	60.0	3.9		5.8	30.3		
1947	8	61.0	7.8		5.4	25.9		
1946	8	64.2	6.1		6.1	23.5		
1949	8	62.8	5.8		5.8	25.6		
1950	8	66.0	5.2		5.8	23.1		
1951	8	65.7	5.3		6.4	22.7		
1952	8	64.9	5.3		8.0	21.6		
1952	36	59.4	1.7	6.0	9.2	5.7	7.5	10.5
1953	36	58.2	2.9	6.0	8.4	5.7	7.3	11.5
1954	36	55.8	4.3	6.1	8.9	5.7	7.0	12.3
1955	36	57.2	5.0	8.0	8.2	4.7	5.8	11.1
1955	30	56.2	4.8	7.5	8.9	4.8	6.2	11.0
1956	30	53.2	5.8	9.6	8.3	5.1	6.4	12.2
1956	27	52.8	5.0	9.3	8.6	5.0	5.7	12.1
1957	27	53.0	4.8	10.2	8.2	4.8	6.1	13.6
1957	22	53.5	2.6	8.8	9.6	5.3	5.3	14.0
1958	22	49.1	3.6	10.0	9.1	5.5	6.4	14.5
1958	21	50.0	3.8	10.4	9.4	5.7	6.6	15.1
1959	21	55.6	3.2	9.6	8.8	4.0	5.6	13.7
1959	20	55.1	3.1	10.2	7.9	4.7	5.5	13.4
1960	20	54.0	4.3	12.2	7.9	4.3	4.3	12.9
1960	18	54.5	4.5	12.9	8.3	3.8	4.5	12.1
1961	18	49.2	3.8	17.4	8.3	3.8	4.5	12.9
1961	15	47.0	4.3	17.4	8.7	4.3	4.3	13.0
1962	15	50.7	3.7	17.2	8.2	4.5	4.5	11.0

Source: See Table 13.

TABLE 13

SOURCES OF FUNDS, ALL SIZES OF SALES FINANCE COMPANIES, SAMPLE SURVEYS

			Percentage Distribution					
			Long-Term Debt			Net Worth		
						Capital Stock		
End of Year	Number of Companies	Notes Payable	Unsubordinated	Subordinated	Other Liabilities	Preferred	Common	Surplus
1945	40	27.9	3.8[a]		15.7	52.7		
1946		46.1	9.3		16.9	27.6		
1947		56.2	11.0		13.2	19.5		
1948		52.1	20.7		9.9	17.3		
1949		49.0	24.1		11.1	15.8		
1950		49.1	24.6		12.1	14.2		
1951		51.4	24.6		9.6	14.3		
1952		54.7	22.7		9.6	13.0		
1952	78	55.0	14.7	6.2	10.7	1.9	4.0	7.4
1953		46.1	25.0	8.3	8.5	1.6	3.8	6.7
1954		41.1	25.2	9.8	11.1	0.9	4.0	7.8
1955		45.7	26.6	8.5	8.6	1.3	3.5	5.8
1952	71	54.9	14.9	6.0	10.9	1.9	4.0	7.4
1953		46.0	25.3	8.2	8.5	1.6	3.8	6.7
1954		40.9	25.5	9.7	11.2	0.9	4.0	7.9
1955		45.5	26.8	8.4	8.6	1.3	3.4	5.8
1956		40.9	29.6	9.1	9.6	1.4	3.2	6.2
1953	68	46.0	25.3	8.2	8.5	1.6	3.8	6.7
1954		40.9	25.6	9.7	11.2	0.9	4.0	7.9
1955		45.5	26.9	8.4	8.6	1.3	3.4	5.8
1956		40.9	29.6	9.1	9.1	1.4	3.2	6.2
1957		40.7	29.5	9.1	9.8	1.3	3.0	6.6

TABLE 13 (Continued)

			Percentage Distribution					
			Long-Term Debt			Net Worth		
						Capital Stock		
End of Year	Number of Companies	Notes Payable	Unsubordinated	Subordinated	Other Liabilities	Preferred	Common	Surplus
1954	63	40.8	25.6	9.7	11.2	0.8	4.0	7.9
1955		45.5	26.9	8.5	8.6	1.3	3.4	5.8
1956		40.8	29.7	9.1	9.6	1.4	3.2	6.2
1957		40.6	29.5	9.1	9.8	1.3	3.0	6.6
1958		35.2	32.5	10.2	9.1	1.5	3.3	8.2
1955	62	45.5	26.9	8.4	8.6	1.3	3.4	5.8
1956		40.8	29.7	9.1	9.6	1.4	3.2	6.2
1957		40.6	29.6	9.1	9.9	1.3	3.0	6.6
1958		35.2	32.5	10.2	9.1	1.5	3.3	8.2
1959		38.4	31.0	10.0	8.5	1.3	2.9	7.9
1956	60	40.8	29.7	9.1	9.6	1.4	3.2	6.2
1957		40.6	29.6	9.1	9.9	1.3	3.0	6.6
1958		35.2	32.6	10.2	9.1	1.5	3.3	8.2
1959		38.4	31.1	10.0	8.5	1.3	2.9	7.8
1960		38.5	31.6	10.0	8.2	1.2	3.1	7.5
1957	53	40.5	29.8	9.1	9.9	1.3	2.9	6.6
1958		35.1	32.8	10.2	9.1	1.4	3.3	8.1
1959		38.2	31.3	10.0	8.5	1.2	2.9	7.8
1960		38.4	31.7	10.0	8.2	1.2	3.1	7.5
1961		32.3	30.7	13.4	10.9	1.2	3.2	8.2

TABLE 13 (Continued)

End of Year	Number of Companies	Percentage Distribution							
		Notes Payable	Long-Term Debt		Other Liabilities	Net Worth			
						Capital Stock			
			Unsubordinated	Subordinated		Preferred	Common	Surplus
1958	48	35.1	32.8	10.1	9.1	1.4	3.3	8.1
1959		38.3	31.3	10.0	8.6	1.2	2.9	7.8
1960		38.3	31.8	10.0	8.2	1.2	3.1	7.4
1961		32.3	30.7	13.4	10.9	1.2	3.2	8.2
1962		36.8	29.8	9.8	11.6	1.1	3.0	7.9

Source: Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, p. 36, Appendix Table 1 for 1945 - 1952, 40 companies, and 1952 - 1955, 78 companies; Board of Governors of the Federal Reserve System, Unpublished Data (mimeographed) for balance of years.

[a] Data for first eight surveys available only as total long-term debt and total net worth.

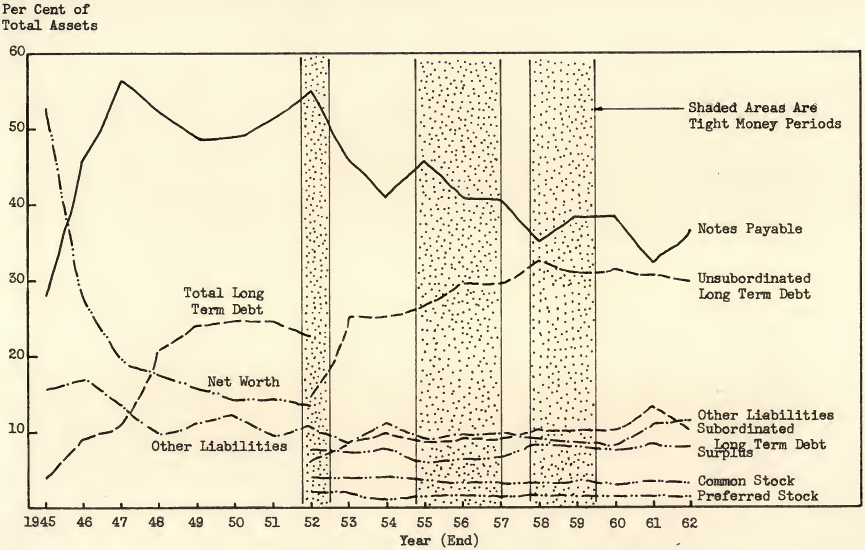

Figure 8.--Sources of Funds of Sales Finance Companies of All Sizes.

contribute substantially to this category. The percentage changes in the use of subordinated debt have not always coincided with those of unsubordinated, but in general the movement has been similar.

Sales finance companies in the $50 - $349 million asset size group have shown a more gradual increase in their use of long-term debt. Most of this rise has been in the use of unsubordinated debt. Their use of short-term debt has decreased accordingly, but not as rapidly as that of the "over $350 million" group. Their reliance on "notes payable," while less than in earlier years, exceeds that of the largest companies, therefore, by a greater margin than previously.

This margin of difference does not exist between the third and second largest size groups. The use of "notes payable" by the $10 - $49 million asset size companies has stayed quite similar to that of the $50 - $349 million group. This has been accomplished, however, through a greater use of subordinated debt by the former. Preferred stock has been used to a slightly increased extent in the third largest group and surplus has remained at a high level, although common stock has declined to the lowest percentage of any size groups.

The use of subordinated debt by the smallest sales finance companies (under $10 million asset size) has risen even more rapidly in recent years than it did in the 1953-57 era. Many rely exclusively on this type of long-term debt although the cost is higher due to the added risk.[1] As a result of this source of funds and the continued substantial rise of equity funds, "notes payable" for these smallest sales finance companies runs only slightly higher than for the next two larger groups.

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, p. 22.

Additional sporadic and erratic variations in consumer instalment sales credit can be found in the credit unions' response to individual industry and company situations. Although the effect of any one may be small, they tend to cause a greater lag in the total response of consumer instalment sales credit to monetary policy, since their changes are based on cut-backs or increases in production and/or personnel. Their source and use of funds for sales finance tend to move together, because the same group is involved in both aspects of their operation. The effect of tighter or easier money is not felt as quickly or fully in this aggregate area, because it is a secondary effect based on the reactions of enterprises which have some lag in their own response.

Commercial banks depend primarily on deposit liabilities for their funds, and equity capital forms a small source by comparison. But the volume of deposits is dependent in turn upon the availability of reserves. Excess reserves, which could result from open-market buying on balance by the Federal Reserve System, can be employed by the banking system to increase demand deposits by a multiple of the excess. A reduction of reserves through open-market selling would retard an expansion of or even cause a reduction in demand deposits by a multiple of the change. The multiple in each case depends upon the reserve ratio.

The variations in the supply of commercial bank funds in the postwar period may be seen in Table 14. In addition to the absolute values, the deposit-capital ratio provides a means of comparing the relative employment of these two sources throughout the period. Although deposits have nearly doubled from 1945 to 1963, the downward trend of the deposit-capital ratio indicates the buildup of capital funds at a greater rate.

Aside from the sharp change from 1945 to 1946 caused by the Treasury debt reduction, the decline in the ratio has been gradual. When the Treasury reduces its debt held by commercial banks, as it did in the immediate postwar period, the effect is essentially to reduce the commercial bank liabilities to the Treasury as payment for the retired or matured obligations. Thus, Treasury deposits and, therefore, total deposits of the commercial banks declined due to this action.

The effect of monetary policy in this period generally has been to contain the growth of deposits. There has been also a tendency on the part of bankers to plow more capital funds back into their operations. Some effect of varying monetary policy can be noted, however, even in these yearly data. The ratio can be seen to level off or rise slightly as a tight money period is entered, indicating the greater expansion of deposits which has been occurring. As the tight money period persists, the growth of deposits is restrained and the ratio trends lower again. The source of commercial bank funds is thus dominated by the effect of monetary policy on reserves and deposits.

TABLE 14

SOURCES OF FUNDS FOR ALL COMMERCIAL BANKS IN THE UNITED STATES

(Amounts in Millions of Dollars)

Year Ending December	Total Liabilities and Capital	All Deposits	All Capital	Other Liabilities	Deposit-Capital Ratio
1945	160,312	150,227	8,950	1,135	16.8
1946	149,718	139,033	9,577	1,108	14.5
1947	155,377	144,103	10,059	1,215	14.3
1958	154,702	142,843	10,480	1,379	13.6
1949	157,677	145,174	10,967	1,536	13.2
1950	168,932	155,265	11,590	2,077	13.4
1951	179,465	164,840	12,216	2,409	13.5
1952	188,603	172,931	12,888	2,784	13.4
1953	193,010	176,702	13,559	2,749	13.0
1954	202,378	184,757	14,576	3,045	12.9
1955	210,734	192,254	15,300	3,180	12.6
1956	217,460	197,515	16,302	3,643	12.1
1957	222,696	201,326	17,368	4,002	11.6
1958	238,651	216,017	18,486	4,148	11.7
1959	244,686	219,903	19,556	5,227	11.2
1960	257,552	229,843	20,986	6,723	10.9
1961	278,561	248,689	22,459	7,413	11.1
1962	287,116	262,122	24,094	10,900	10.9
1963	312,773	275,120	25,677	11,976	10.7

Source: *Federal Reserve Bulletin*, appropriate issues.

Commercial banks have contributed to a slower response of instalment sales credit to monetary policy restrictions because of competition for the considerable amount of sales finance business involved.[1] Consumer credit has become a volume business, and unless the volume is maintained, profits drop. Yields on these loans are relatively high, and offer an opportunity for banks to offset the increasing cost of funds occurring through the use of debt instruments and higher rates of interest on savings deposits. Then, too, there is a reluctance on the part of banks to change policy quickly, especially in this area, a measure which could be used to hold down a rising volume of credit extensions.[2] Their ability to shift funds and avoid the impact of monetary policy on any particular sector rapidly decreases, however, as a tight money condition continues in effect.

Supply Factors as Determinants of the Volume of Consumer Instalment Sales Credit

Studies of the supply of, and demand for, consumer instalment sales credit provide the basis for an integrated view of the elements in the national economy each of which have some substantial relationship to the aggregate amount of such credit. The availability of credit in the postwar period is one of the numerous factors which has influenced the amount of consumer instalment sales credit granted.

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 67-68.

[2] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 67-68.

Late in the 1952-53 period and again in the latter part of 1955-56, the sales of consumers' durables began to receive the impact of credit stringency just as the demand had begun to slacken.[1] These were the two high points in the credit granted series. There is no time in the period under observation, therefore, when the consumer instalment sales credit market was substantially affected by a shift to the left of the supply function due to tight money conditions, although the stringency certainly appears to have had some influence. It has been seen in Figures 6 and 7 that the use of Regulation W had an effect on the use of sales finance credit. Varying economic conditions, without the influence of Regulation W, have also influenced the volume of credit. It is entirely possible that a more intense and sustained demand for consumer instalment sales credit could be strongly affected through the restriction of supply by a tight money policy. Two factors emerge on the supply side, which should be considered in the determination of the volume of consumer instalment sales credit. The first factor is some indicator or indicators of tight or easy money conditions. The second is an indicator of the stringency of terms (downpayment, time to maturity) for sales finance.

Any point of impact of a change in monetary policy is difficult to determine and, in fact, may shift due to changes in concomitant fiscal policy and other economic and political factors. The problem of incorporating the effect of monetary policy in a quantitative economic study is twofold. The first question is the choice of suitable quantitative measures of monetary conditions. The second is whether they lead, lag, or are coincident with the indicators of the economic area affected. In this chapter monetary policy was viewed in terms of two elements of the complex, Treasury Bill rate and net free reserves. If quantification of the direct effect of monetary policy is possible, these two characteristics are most suitable for investigation. Net free reserves, fluctuating between positive and negative values, indicate very pointedly the general availability of credit through commercial banks. Treasury Bill rate, while subject to an upward trend, reflects the fluctuation in the cost of credit resulting from tight and easy monetary policies.

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 2, pp. 84-88.

Although the relationship indicated graphically in Figures 6 and 7 between monetary policy and the consumer instalment sales credit, provides some evidence of the two coinciding, it is difficult to draw any conclusions concerning the incidence of its impact, clouded as it is by the influence of other factors. It would seem intuitively that some lag might exist between the imposition of a tight money policy and an effect on sales finance. If a lag does exist, how much is one question, but another equally difficult is how much time lag exists between the Federal Reserve action and the movement of the quantitative indicators of monetary policy being observed and any varying characteristics of this lag. Assumptions of differing lag times between the indicators and the measure of sales finance must be made and tested for any further determination.

The areas of selective control of consumer instalment sales credit incorporated in Regulation W, downpayment and length of repayment period, provide an element of supply even when not under governmental control. These two conditions combine to provide the factor which appears to concern consumers more than total price, the amount of the monthly payment. A means of incorporating this factor in the regression analysis along with the indication of monetary policy and the demand elements, will be described in Chapter V. Before this step is taken, however, another aspect of the supply picture, that of competition among suppliers, will be discussed. Consideration of this institutional view of the sales finance field is appropriate preparatory to drawing together the elements of demand and supply.

CHAPTER IV

ELEMENTS OF COMPETITION IN SUPPLY

Although, as noted previously, a small part of the total sales finance picture, the rapid growth of credit unions has provided a comparison of the costs of obtaining consumer instalment sales credit from dealers and banks with those from a source which has low operating expenses and operates on a minimum profit margin. This factor, along with the greater availability of suppliers as a result of the overall increase in competition for the instalment sales credit business, has provided a basis for a more careful appraisal of the differentiation offered to consumers in this industry.

Increasing familiarity with the use of commercial banks by lower income groups, who are the greater users of instalment credit, has made these institutions a more competitive source in recent years. Having overcome a prior reluctance to enter the consumer loan field actively some years ago, banks are now readily available for their growing numbers of customers to contact as suppliers of credit for the purchase of durables. Nationwide sales finance companies, notably General Motors Acceptance Corporation (GMAC), have taken advertising campaigns to induce buyers to designate their financing arrangements when negotiating with a dealer for consumer instalment credit. Local or regional sales finance companies are often able to offer the dealer a more personal relationship, as do commercial banks, than that of the nationwide organizations. Sales finance companies, especially the smaller ones, may operate in a specialized manner, particularly accepting poorer risks at higher rates. Some price competition is present among sales financing organizations. Especially in the area of automobile instalment loans, banks have offered less than the going rate because their customers are better than average credit risks. On the upper side of the supply curve, some sales finance companies obtain their share of the market by accepting greater risks at higher rates. Credit unions have been instrumental in the lower-rate move by making increasingly more consumers aware of the possibility of a reduced cost of this type of borrowing. Thus the situation is one of some overall price competition plus a variety of elements of nonprice competition, primarily among banks; nationwide, regional, and local sales finance companies; and credit unions.

Nonprice Competition

The "differentiated product" under consideration and the nonprice elements which enter into its structure provide the basis for analyzing the supply of consumer instalment sales credit by categorizing the elements already described and others pertinent to the discussion so that the market can be viewed as a study of imperfect competition.[1] Although all the factors which affect the decisions of consumers will show considerably more similarity among institutions of the same type than between two which are of different types, the range of varying characteristics which organizations in the same category may display is, nevertheless, considerable. One commercial bank will follow more closely the pattern of another commercial bank, in the image it presents to the consumer, than it will that of any credit union, but wide differences may exist between commercial banks, particularly where one is large and the other modest in financial size. In addition, the approach to supplying consumer instalment credit by a city bank and a country bank with comparable total deposits and capital may differ greatly because of the difference in customers they serve.

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[1] See Theodore O. Yntema, "The Market for Consumer Credit: A Case in 'Imperfect Competition,'" The Annals of the American Academy of Political and Social Science, CXCVI (March, 1938), 79-85.

The areas of differentiation among the various competing suppliers may be viewed as follows:

1. Type of security required.
2. Loan policy and procedure.
3. Collection policy and procedure.
4. Size of loan.
5. Schedule of payments.
6. Method of charge.
7. Status of lender.
8. Personal relations.
9. Association of lending with the sale of other goods.[1]

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[1] Yntema, pp. 79-81.

Although this present study is concerned only with instalment sales credit related to the purchase of consumers' durable goods, it is impossible to view this field completely dissociated from that of "personal finance" or other credit not directly connected with the purchase of durable goods. Since a consumer may choose to borrow money and make his purchases in cash rather than engage in a credit transaction for the goods, sources other than "sales finance" lenders might be considered competitors for consumer sales credit. It is true also that a consumer may mortgage his house for a larger amount to obtain or preserve cash balances to be used in procuring the appliances with which to equip it. It is not possible to consider all available sources of credit which might furnish the funds to be applied ultimately toward such consumption. It is reasonable to believe, however, that most consumers use a direct method of financing these purchases rather than involve themselves in "source and application of funds" type of planning. Therefore, the assumption will be made that the alternatives from which the credit purchaser chooses are based upon the use of some type of instalment sales financing of the durable goods, and the other avenues will be ignored in this study as insignificant by comparison.

In considering the categories indicated, some of them will be grouped together because of their overlapping and interacting nature, while others will be discussed entirely separately. Whereas, "type of security required" may not vary widely from one lender to another, it does deserve separate consideration due to its potential for differentiation. On the other hand, "loan policy," "collection policy," "schedule of payments," and "method of charge" will generally be considered together by the borrower, if he is aware of them, and an overall resulting impression of each source considered will contribute to his decision through its qualitative import. These factors will be discussed together, along with "association of lending with the sale of other goods," under the subsequent heading of "retailers' influence."

"Size of loan" does not often enter into the instalment sales finance picture unless the borrower wishes to exceed the limitations which his credit rating imposes. His alternative then is to seek a lender (through a retailer or as a result of his own outside investigation) who, by means of more stringent terms, will grant him the larger loan. Thus, the choice becomes one of higher charges or tougher collection policy coupled with a larger loan, against that of a smaller loan and easier terms. Some other possibilities of loan size restrictions will be mentioned under the heading of "determination of source of supply."

"Status of lender" and "personal relations" are discussed under the headings of "choice of other sources" and "determination of sources of supply." These considerations pertain especially to the choice of outside financing, although they are involved also if the retailer should offer optional sources.

Type of Security Required

The first category represents a small area of differentiation between alternatives, since the pledge of the durable concerned in some manner is part of every sales finance contract. Whether the instrument which, in effect, pledges the collateral is a chattel mortgage or a conditional sales contract, is usually not a choice open to the consumer or lender. This question is most likely resolved by the laws of the state in which the individual resides. One might reason that sales finance credit, since it is a secured loan, would cost the average consumer less than a personal unsecured loan. Such is not necessarily the case, and there is some justification for its being so. The value of an automobile, for example, once it has been in service, cannot easily be established accurately without frequent inspection. An automobile may represent, therefore, only a token security against the loan granted for the original purchase, based largely on the psychological standpoint of an owner's desire to retain possession of his property. Also, its very mobility detracts from its value as collateral. Not only may the security be removed easily from the creditor's span of control, but it in itself provides a vehicle for the debtor's imminent departure from the creditor's jurisdiction, should the former find the burden of repayment too troublesome. The lender, therefore, sometimes requires more protection against possible loss than would be true in the inherently more stable type of situation in which a regularly employed working man borrows a relatively small sum for his personal use on his signature only.

Whereas, personal loan interest rates are generally limited by law, finance charges on sales credit transactions are not. When calculated as simple interest, the total charges involved in financing the purchase of a consumers' durable may in some cases prove to be greater than the cost of an unsecured personal loan of the same amount. This is not to say, however, that the purchaser of a durable who pays the higher financing charge could necessarily get the unsecured personal loan. Some instances of demands for extra security by sales finance companies also have been noted.[1] These have taken the form of chattel mortgages on possessions not involved in the purchase for which the loan was made, co-signers or endorsers, or wage assignments. Thus it appears that the question of the type of security required customarily offers little or no choice to the consumer-buyer. It will be the appropriate or required legal form of a first claim by the lender on the durable purchased.

Retailers' Influence

When financing arrangements are made through the retailer, a number of financing conditions are prescribed. The loan policy, collection policy and procedures involved will be those of the dealer himself or the financing institution to whom the dealer discounts his paper. The retailer's status as a business concern, personal relations with his customers, and association of lending with sales of other goods, will provide a basis for differentiation between dealers when terms and schedules of payment are reasonably similar. Terms and schedules of payment will provide a choice of seller, of course, if differentiation in that area is sufficiently great. In effect a substitute for price, monthly payments provide a substantial selling point where instalments are involved. It is customary for retailers to have working agreements with banks and sales finance companies for the financing of instalment paper which they write. Sales finance companies, as a rule, do not negotiate any loans directly with consumer borrowers but lend indirectly by discounting notes from instalment sales.[1] Part of the arrangement between dealer and financing organization is the "pack," that part of the finance charge which is a kick-back to the dealer, designed to cover his expenses incident to the instalment sale, but generally exceeding them. Thus the dealer may have a strong economic basis for his choice of financing arrangement. The choice often is predicated upon the understanding that the dealer's "floorplanning" or financing of his inventory will be assumed also by the lender on a small margin of profit. Therefore, much of the differentiation which might be presented to their customers is not present in the operation of an individual dealer. Dealers may find it beneficial to associate themselves with local financing organizations rather than a nationwide company because of the close contact possible or the nationwide company might be preferred because of its known established policies and procedures and the image this creates. Although the dealer may associate himself with more than one sales finance company or bank, a choice of these will not always be available to the buyer, but may be used by the dealer to place the paper in the manner he deems most suitable. The choice of buying on credit or not, as a basic differentiation, becomes in itself an area for retailers' influence, with many likely cash buyers steered into a credit sale because the retailer stands to profit more from that transaction. In addition it preserves the customer's buying power for further sales of other durables from the dealer.

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[1] Plummer and Young, p. 240.

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[1] See Plummer and Young, p. 48.

Choice of Other Sources

Some sales finance organizations offer the opportunity for consumers to make arrangements for instalment credit directly without reference to the dealer from whom they are purchasing the durable. Credit unions function in this area exclusively, but their potential customers are limited to their shareholders. Through their proximity to and close connection with these people during their working hours, the problem of advertising is simplified, and they can inform the employees of their services with a minimum of expenditure. Since the profits from their operations are returned in part to the loan customers through dividends on their shares, this type of financing should be more attractive than any other, if the customers' other requirements as to size of loan and time to maturity can be equally well met.

Commercial banks often make loans directly to their customers, especially for the purchase of automobiles. They have the advantage of offering their customers a wide variety of services and therefore, have an individual attraction as a place to obtain consumer financing. The borrower is given the convenience of continuing to conduct all or most of his financial transactions at one convenient location. Since banks take only the better credit risks, the choice is not offered to all potential users of sales finance. As in the case of the credit union, the size of the loan and length of time for repayment may also be limitations of the banks' policies compared to other lenders.

Advertising

The services of sales financing organizations have a low demand coefficient of elasticity, and consequently a greater spread between selling price and marginal operating expense should exist, in accordance with imperfect competition theory.[1] This should be the basis for substantial advertising expenditures by these institutions in order to "sell" credit. By engaging in more advertising some reduction in the competition between various sources might be attained. Geographical differences would still prohibit some seller-buyer contacts, of course, but ignorance of the existence of lending agencies by borrowers, which may often be a bar, can be eliminated. Descriptive advertising could better inform the prospective borrowers of the character and true cost of competing services. A reluctance to induce discussion of the latter may be a factor in retarding the amount of advertising done by these agencies. Nevertheless, effective promotion is still possible.

Determination of Source of Supply: Summation

When a customer selects his dealer and arranges financing at the time of the sale, the choice of lender is often not within the province of the borrower. If he is new to credit purchasing the customer may not even realize that the paper will probably not stay with the dealer. If he has some choice in the matter, his decision will more than likely be based on slight knowledge. He might lean toward GMAC or other affiliated companies because of the reputation of the parent company or in the belief that this may insure him better service for the article purchased. He may shy away from a company whose reputation (hearsay or otherwise) does not meet with his favor. Few of the areas of differentiation will come into play, however.

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[1] Yntema, p. 83.

On the other hand, should the purchaser decide to arrange for sales financing without reference to the dealer, or should the dealer offer him a choice, he may be influenced by most of the other factors described. It is doubtful even today that many prospective purchasers do much shopping for the source of their borrowing and subsequently perform a thorough evaluation. In most cases some few qualitative aspects will dictate the final choice. A credit union often has an immediate inside track due to the convenience of making the loan at a location adjacent to the place of business and having the payments automatically deducted from one's pay. In a few instances, especially in small new credit unions, the size of loan may be restricted due to an insufficient supply of funds. Some borrowers might view the deductions from salary in a different light, reasoning that if payment becomes difficult, due to unforeseen, financial problems, they will be unable to use their own incomes in a completely discretionary manner. In addition, it has been the writer's own experience that two extremes may exist in regard to convenience of location. Under some circumstances, especially in a moderate size business, the credit union office may be located on the company premises within easy reach of all employees. In the case of a large industrial organization, the credit union may be in a separate building a few blocks away from the outskirts of the plant, and this may represent a walk of over a mile each way during a lunch period for some employees.

Commercial banks are known for their attractive facilities, efficient handling of applications, and increasingly more easily accessible locations. Credit standards are generally higher than those of other lenders; but, accordingly, collection policies and procedures are not as harsh. This limits the commercial banks' prospective borrowers to those who are the better credit risks. Many people prefer to do business with a bank because of its stature as a financial institution, feeling, for example, that their affairs are kept more confidential there than they would be in a company credit union. Altogether there is a growing trend for durable goods customers to make their own arrangements for instalment sales financing. Credit unions have helped to spark this movement and commercial banks have added encouragement to it.

CHAPTER V

THE METHOD AND BASIS FOR A STATISTICAL ANALYSIS OF THE AUTOMOTIVE SECTOR, 1946-1963

Time series regression analysis brings a major difficulty involved in the statistical evaluation of economic data into clear perspective, that of a changing surrounding environment for the variables under study in contrast to the more controlled environment possible for an experiment in the laboratory. It is possible to successfully conduct the economic time series analysis and obtain useful results if the variables are properly selected and employed.[1] A primary consideration is that the basic character of the variables be compared aside from the influence of trends. First, to adjust for changes in purchasing power, dollar amounts should be expressed in constant dollars by applying the proper deflator to current dollars. Second, in order to take cognizance of the effect of the growth in population on consumer related financial statistics, these data should be put on a comparable consumer unit basis for each period. Finally, a time element should be added to the regression analysis to account for any other trends. By eliminating the factors which have similar effects on numerous variables, such as price rises, population growth, and changes in tastes or cross-sectional distribution, the net relationship of the variables under consideration can be determined aside from any false correlation which might be indicated by a common movement in one direction of the independent and dependent variables.

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[1] See Mordecai Ezekiel and Karl A. Fox, Methods of Correlation and Regression Analysis (New York: John Wiley and Sons, 1959), pp. 325-347; and Herman Wold, Demand Analysis (New York: John Wiley and Sons, 1953), pp. 57-59.

The purpose of this chapter is to describe the procedure for statistically analyzing the relationship between the use of consumer instalment sales credit and the quantitative elements of the economy, including the Index of Consumer Attitudes, which relate to it. This will be accomplished by an analysis of the automotive area, which will provide the proper foundation for an appraisal of the total role of consumer instalment sales credit, as discussed in the Introduction. This also is the consumers' durable goods area for which data to be analyzed are most complete.

> The expenditure that is financed by instalment credit may be for a variety of purposes. It may be for medical or remedial needs, for education, for travel, or for vacations. The dominant portion of such expenditures, however, is for consumer durable goods, and the automobile with its high initial cost, is the biggest single factor in this market.[1]

For this study multiple regression equations containing the related variables have been developed based on the concepts stated previously. These equations will be described in detail in this chapter. The choice of the period for the analysis results from the advent of World War II. The changing structure of our economy lessens the effectiveness of an analysis of consumer instalment sales credit data of an earlier period for its application to the present. The war years caused a gap to exist which could not be bridged in a statistical analysis with any great hope of success. So much technological and social change had resulted, that an attempt to analyze empirical data of the prewar period and relate them to the requirements of today's consumers' desires and institutions would be unproductive and misleading. It is to be expected that the relative importance of some of the factors affecting the extension of instalment sales credit would be modified by these structural changes.[1] It should be noted, also, that in general, pre-World War II figures, as might be expected lack the precision of more recent estimates.[2]

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[1] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 1, pp. 217-218.

The cessation of production and sales of automobiles in the war years laid the groundwork for a postwar recovery period which would subject instalment credit to unusual forces, in particular to some continued imposition of Regulation W, to pent up demand, and to pegged interest rates. Regulation W provided the Federal Reserve Board with the authority to require minimum downpayments and maximum lengths of time to maturity for the instalment sales of various consumers' durables, while the pegged interest rates prevented its free use of the quantitative tools of monetary policy. The existence of these unique conditions indicates the need for conducting the statistical analysis in such a manner that the effects of the immediate postwar period will be evaluated. The period 1952 through 1963 provides a picture of "normal" operations of the institution of consumer instalment sales credit in our economy. It will be treated as such by being subjected to a separate multiple regression analysis.

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[1] Kisselgoff, p. 1.

[2] Federal Reserve Board, Consumer Instalment Credit, Part I, Vol. 1, p. 206.

Summary of Variables in the Analysis

As has been determined, automobile instalment sales credit granted (extended) is to be used as the dependent variable. These data, which relate to the current demand for cars and not to prior periods, are available from the Federal Reserve Board's published statistics. Since these are in terms of current dollars they will be put in constant dollar form by using the Bureau of Labor Statistics' Retail Price Index of New Automobiles as a deflator. In addition, the data will be put on a "per million consumer unit" basis by using a divisor based on the Bureau of Census population estimates.

The first independent variable to be considered is that of the financial position of consumers in terms of disposable income. The Office of Business Economics provides these data in current dollars. Disposable income is then put on a "per million consumer unit" basis. The retail price index of total consumption goods, also obtained from the Bureau of Labor Statistics, is used as a deflator for this variable. The preceding year's savings component of consumer disposable income is the next variable. It is also obtained from the Office of Business

Economics, divided by the retail price index of total consumption goods, and put on the "per million consumer unit" basis.

The automobile price index divided by the average monthly duration of automobile instalment sales contracts is used as an index of the average monthly instalment payment. This value is converted to a constant consumer dollar basis, comparable to the other independent variables, by then applying the total consumption goods price index deflator to the resulting quotient.[1] The calculation of the average monthly duration is made from instalment sales data obtained from the Federal Reserve Board's published statistics as follows: first, compute monthly collection ratios (CR), that is, one month's repayments as a percentage of outstandings at the end of the preceding month; next, convert the collection ratios to implied average repayment periods (in months) by the formula as follows:

$$\text{DUR (maturity in months)} = \frac{2}{\text{CR}} - 1, \text{ where CR} = \frac{\text{DR}}{\text{DO}}.$$ [2]

(DR = current month's repayments and DO = previous months' outstanding amount.)

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[1] See Kisselgoff, p. 30, for discussion. Downpayment and finance charge percentages would be used, if available, in the numerator so that monthly payment equals

$$\frac{\text{PNA (1 - downpayment + finance charge)}}{\text{DUR} \cdot \text{PTC}} .$$

The assumption is that without these percentages the equation is still representative of the monthly payment.

[2] M. R. Neifeld, Neifeld's Guide to Instalment Computations (Easton, Pennsylvania: Mack Publishing Company, 1951), pp. 258-260.

The stock of automobiles in terms of 1954 (constant) dollars is obtained from data furnished by the Federal Reserve Board's Division of Research and Statistics. By dividing them by the millions of consumer units, comparable data are once again obtained. The next two factors are those of mortgage debt outstanding and total consumer instalment debt outstanding. These data also are subject to adjustment by the consumer unit data and retail price index for total consumption goods. They are obtained from the Federal Reserve Board's published statistics, supplemented by their division of Research and Statistics. The next independent variable, the Index of Consumer Attitudes enters into the regression without any adjustment, because of its undimensional, relative nature.

The indicators of monetary policy, free reserves of member banks and Treasury Bill rate, are used without further adjustment. Any changes in their basic relationship to the dependent variable are assumed to be accounted for by the last independent variable in the multiple regression equation, the trend factor. Free reserves and Treasury Bill rate are also obtained from the Federal Reserve Board's published statistics. To include time as a linear trend element, it is merely necessary to denote this variable by an arithmetic series. This will be done here, starting with 1 for 1946, second quarter. If the time effect on trend were nonlinear, the second or higher powers of time or the logarithm of time might be used. This possibility will be tested in the regressions to follow.

Symbolic Presentation and Source of Data

ACG - Automobile instalment sales credit granted (billions of dollars, seasonally adjusted). *Federal Reserve Bulletin* and Supplemental Federal Reserve Board sources.

FAM - Consumer units (millions). Total families plus 0.4 unrelated individuals from Bureau of the Census *Current Population Reports*, Series P-20. Yearly data interpolated for quarters.

PNA - Consumer price index for new automobiles (1957-59 = 100). Bureau of Labor Statistics communication and *Monthly Labor Review*.

PTC - Consumer price index for all consumption items (1957-59 = 100). *Monthly Labor Review*.

YCU - Personal disposable income (annual rate, billions of dollars). *Survey of Current Business* and *Business Statistics* supplements.

SLA - Personal savings of one year earlier (annual rate, billions of dollars) *Survey of Current Business* and *Business Statistics* supplements.

DO - Automobile instalment credit outstanding (billions of dollars). *Federal Reserve Bulletin* and supplemental Federal Reserve Board sources.

DR - Automobile instalment credit repayments in the following month (billions of dollars). *Federal Reserve Bulletin* and supplemental Federal Reserve Board sources.

DUR - Approximate average duration of automobile instalment sales contracts (Months $= \frac{2DO}{DR} - 1$).

STA - Stock of automobiles in the hands of consumers (original cost depreciated, billions of dollars). Federal Reserve Board supplemental source. Yearly data interpolated for quarters.

MRO - Mortgage debt outstanding on nonfarm, 1 - 4 family properties (billions of dollars). *Federal Reserve Bulletin* and Federal Reserve Board communication. For 1946, 1947, and 1948 yearly data were interpolated for quarters.

TIO - Total consumer instalment debt outstanding (billions of dollars). *Federal Reserve Bulletin* and Federal Reserve Board supplemental source.

OPN - Index of Consumer Attitudes (opinions). Survey Research Center, University of Michigan, *Survey of Consumer Finances* and personal communication.

FRS - Free reserves of member banks (billions of dollars). *Federal Reserve Bulletin*.

TBR - Treasury Bill rate (per cent). *Federal Reserve Bulletin*.

TREND - Arithmetic series 1, 2, 3, 4, ..., N.

The use of the preceding variables in the manner described results in the corrected variables to be employed in the multiple regression analysis:

$$\frac{ACG}{FAM \cdot PNA} = CACG = Y$$

$$\frac{YCU}{FAM \cdot PTC} = CYCU = X(1)$$

$$\frac{SLA}{FAM \cdot PTC} = CSLA = X(2)$$

$$\frac{PNA}{PTC \cdot DUR} = DURI = X(3)$$

$$\frac{STA}{FAM} = CSTA = X(4)$$

$$\frac{MRO}{FAM \cdot PTC} = CMRO = X(5)$$

$$\frac{TIO}{FAM \cdot PTC} = CTIO = X(6)$$

$$OPN = X(7)$$

$$FRS = X(8)$$

$$TBR = X(9)$$

$$TREND = X(10)$$

Table 15 shows all the basic data described above. The first two quarters of 1964 are included so that Y at "time plus one period" and at "time plus two period" could be considered with the X's at "time" without losing any observations. The results of the above calculations to provide data for the multiple regression program are shown in Appendix B.

TABLE 15

AUTOMOBILE SECTOR DATA FOR CALCULATION OF MULTIPLE REGRESSION VARIABLES

Date																
Year	Qtr.	ACG	FAM	PNA	YCU	SLA	PTC	DO	DR	STA	MRO	TIO	OPN	FRS	TBR	TREND
1946	1	.377	38.85	n.a.	150.6	34.1	63.6	.52	.10	5.09	19.6	2.63	n.a.	.505	.38	
	2	.438	38.93	n.a.	154.8	32.5	65.0	.66	.12	5.41	20.7	3.06	n.a.	.816	.38	1
	3	.506	39.02	62.6	162.2	26.7	71.2	.81	.15	5.73	21.8	3.48	n.a.	.736	.38	2
	4	.648	39.10	66.1	164.2	18.8	74.9	.98	.16	6.05	23.0	4.17	n.a.	.743	.38	3
1947	1	.798	39.19	66.1	165.4	16.3	76.4	1.22	.21	6.77	24.2	6.61	n.a.	.698	.38	4
	2	.858	39.54	66.3	164.2	15.1	76.8	1.50	.25	7.49	25.4	5.30	n.a.	.650	.38	5
	3	.899	39.88	70.0	171.7	11.2	80.1	1.69	.28	8.20	26.8	5.77	n.a.	.798	.80	6
	4	1.137	40.22	70.5	176.5	11.0	81.7	1.92	.28	8.92	28.2	6.70	n.a.	.762	.95	7
1948	1	1.255	40.56	70.9	179.8	8.1	81.7	2.25	.32	9.64	29.6	7.18	n.a.	.552	1.00	8
	2	1.253	41.92	71.0	187.8	.9	84.0	2.58	.36	10.36	31.0	7.90	n.a.	.752	1.00	9
	3	1.402	41.29	78.8	193.0	5.1	85.4	2.91	.36	11.07	32.2	8.55	n.a.	.756	1.09	10
	4	1.297	41.65	78.7	192.8	4.5	83.9	3.02	.38	11.79	33.3	9.00	n.a.	.663	1.15	11
1949	1	1.441	42.02	81.0	188.8	4.8	83.0	3.18	.42	12.85	34.1	8.97	n.a.	.546	1.16	12
	2	1.747	42.25	81.2	187.3	11.4	83.1	3.72	.44	13.91	35.0	9.79	n.a.	.658	1.16	13
	3	1.791	42.49	81.8	186.1	14.4	83.2	4.22	.50	14.98	36.3	10.56	n.a.	.847	1.06	14
	4	2.008	42.72	81.8	186.9	13.2	82.3	4.56	.52	16.04	37.6	11.59	n.a.	.685	1.10	15
1950	1	2.124	42.96	81.8	199.0	11.6	82.1	4.87	.53	17.46	39.0	11.89	n.a.	.655	1.14	16
	2	2.182	43.16	81.8	200.3	9.1	83.0	5.50	.58	18.88	41.0	13.03	n.a.	.700	1.17	17
	3	2.360	43.35	81.8	208.3	8.1	85.1	6.19	.64	20.31	43.2	14.45	n.a.	.669	1.32	18
	4	1.864	43.54	82.0	215.8	5.3	87.1	6.07	.67	21.73	45.2	14.70	n.a.	.885	1.37	19

TABLE 15 (Continued)

Date Year	Qtr.	ACG	FAM	PNA	YCU	SLA	PTC	DO	DR	STA	MRO	TIO	OPN	FRS	TBR	TREND
1951	1	1.958	43.73	84.2	218.7	15.2	89.9	5.88	.68	22.44	46.9	14.38	n.a.	.471	1.42	20
	2	2.107	43.88	84.4	224.8	11.8	90.3	6.00	.78	23.15	48.7	14.44	n.a.	.664	1.45	21
	3	2.420	44.02	86.8	227.9	5.8	91.0	6.16	.89	23.86	50.4	14.77	n.a.	.383	1.63	22
	4	2.471	44.16	90.1	232.8	17.6	92.2	5.97	.86	24.57	51.9	15.29	n.a.	.169	1.73	23
1952	1	2.560	44.30	93.0	230.2	8.2	91.6	5.82	.80	24.85	53.3	15.03	n.a.	.578	1.59	24
	2	3.061	44.43	93.0	233.6	20.9	93.4	6.66	.89	25.14	55.1	16.59	n.a.	.130	1.70	25
	3	2.745	44.56	93.5	239.5	20.7	93.0	7.06	.87	25.42	57.0	17.67	n.a.	.095	1.71	26
	4	3.398	44.69	94.1	243.3	20.4	93.0	7.73	.84	25.70	58.7	19.40	96.6	-.870	2.09	27
1953	1	3.561	44.82	94.1	247.9	17.5	92.6	8.40	.90	26.61	60.4	20.15	100.0	-.614	2.01	28
	2	3.277	44.88	94.0	251.0	17.9	93.3	9.24	.90	27.51	62.5	21.47	n.a.	.365	2.11	29
	3	3.103	44.95	94.1	251.7	21.5	93.9	9.77	.98	28.41	64.6	22.32	92.3	.250	1.79	30
	4	3.090	45.01	92.4	251.0	18.4	93.6	9.84	.92	29.32	66.3	23.00	n.a.	.252	1.60	31
1954	1	2.698	45.08	94.6	252.3	19.0	93.6	9.40	.96	29.94	67.6	22.16	93.6	.503	1.03	32
	2	2.843	45.28	94.9	252.3	19.6	93.8	9.60	.98	30.56	69.9	22.50	95.1	.711	.64	33
	3	2.989	45.47	87.2	254.6	19.7	93.5	9.78	.98	31.19	72.7	22.80	98.7	.708	1.01	34
	4	3.277	45.66	93.7	258.4	21.6	93.2	9.81	.95	31.81	75.7	23.57	n.a.	.457	1.14	35
1955	1	3.885	58.85	91.0	263.8	21.0	93.2	10.41	1.03	33.15	78.5	24.05	n.a.	.122	1.28	36
	2	4.273	46.08	88.7	272.0	18.3	93.2	11.79	1.06	34.48	82.2	25.97	104.2	.168	1.41	37
	3	4.425	46.32	83.9	277.7	18.0	93.6	13.07	1.18	35.82	85.5	27.63	n.a.	-.286	2.07	38
	4	4.068	46.56	91.5	283.0	17.7	93.5	13.46	1.18	37.16	88.1	28.91	102.6	-.245	2.54	39

TABLE 15 (Continued)

Year	Qtr.	ACG	FAM	PNA	YCU	SLA	PTC	DO	DR	STA	MRO	TIO	OPN	FRS	TBR	TREND
1956	1	4.089	46.80	90.6	284.6	14.4	93.5	13.73	1.20	37.59	90.8	29.02	n.a.	-.409	2.25	40
	2	3.868	47.94	89.4	291.1	17.8	94.7	14.24	1.21	38.02	93.7	30.06	99.3	-.195	2.49	41
	3	3.756	47.08	88.2	295.2	16.8	95.4	14.52	1.34	38.45	96.6	30.76	99.8	-.214	2.84	42
	4	3.828	47.22	98.7	300.3	19.8	96.2	14.42	1.30	38.88	99.0	31.72	100.3	-.036	3.21	43
1957	1	4.202	47.36	96.8	303.0	19.0	96.9	14.46	1.30	39.26	101.1	31.40	n.a.	-.316	3.08	44
	2	4.120	47.50	95.3	308.8	22.9	98.0	15.03	1.36	39.64	103.4	32.44	94.4	-.508	3.29	45
	3	4.123	46.63	93.0	312.7	24.8	98.7	15.43	1.37	40.02	105.7	33.20	n.a.	-.466	3.53	46
	4	4.015	46.76	100.6	311.2	24.7	99.1	15.34	1.34	40.40	107.6	33.87	86.0	-.133	3.04	47
1958	1	3.627	47.89	98.5	311.4	22.9	100.5	14.75	1.31	40.05	109.1	32.72	82.2	.495	1.30	48
	2	3.428	48.06	97.3	314.2	25.4	100.8	14.57	1.30	39.70	111.5	32.79	86.5	.484	.83	49
	3	3.469	48.23	96.8	321.8	24.0	100.8	14.33	1.34	39.34	114.5	32.86	n.a.	.095	2.44	50
	4	3.769	48.40	106.8	325.0	22.6	100.8	14.15	1.22	38.98	117.7	33.64	92.7	-.041	2.77	51
1959	1	4.324	48.57	104.2	329.6	23.9	100.8	14.39	1.27	39.31	120.5	33.81	n.a.	-.140	2.80	52
	2	4.545	48.78	102.9	338.0	23.3	101.5	15.44	1.35	39.64	124.3	35.70	95.1	-.513	3.21	53
	3	4.637	49.00	100.5	338.8	27.3	102.0	16.32	1.37	39.96	128.0	37.62	n.a.	-.493	4.04	54
	4	4.240	49.21	106.6	341.9	25.2	102.3	16.42	1.29	40.29	130.8	39.24	91.1	-.424	4.49	55
1960	1	4.584	49.43	102.9	344.3	23.9	102.4	16.66	1.34	40.67	133.1	39.41	96.7	-.219	3.31	56
	2	4.619	49.54	101.6	350.3	25.1	103.1	17.59	1.32	41.04	135.9	41.10	92.9	.037	2.46	57
	3	4.338	49.64	98.5	352.2	22.1	103.3	17.84	1.42	41.41	138.8	42.02	95.5	.414	2.48	58
	4	4.105	49.75	103.4	353.4	23.1	103.9	17.69	1.37	41.79	141.3	42.83	92.8	.669	2.25	59

TABLE 15 (Continued)

Date Year	Qtr.	ACG	FAM	PNA	YCU	SLA	PTC	DO	DR	STA	MRO	TIO	OPN	FRS	TBR	TREND
1961	1	3.786	49.86	102.8	355.3	20.1	103.9	17.14	1.30	41.76	143.2	41.67	92.4	.486	2.39	60
	2	3.855	50.14	101.7	362.0	20.6	104.0	17.27	1.38	41.73	146.3	42.09	94.4	.549	2.33	61
	3	4.004	50.41	100.7	367.2	23.4	106.6	17.13	1.46	41.70	149.6	42.33	97.7	.547	2.28	62
	4	4.360	50.68	103.5	373.1	23.0	104.5	17.22	1.45	41.68	153.0	43.53	96.4	.419	2.60	63
1962	1	4.656	50.95	102.4	377.3	25.1	105.0	17.34	1.38	n.a.	155.3	43.08	98.7	.382	2.72	64
	2	4.950	51.10	101.5	382.7	26.7	105.3	18.48	1.49	n.a.	159.1	45.06	96.8	.391	2.73	65
	3	4.928	51.24	100.4	386.5	28.2	106.1	18.97	1.63	n.a.	162.9	46.14	95.0	.375	2.78	66
	4	5.215	51.38	102.6	391.4	29.1	105.8	19.54	1.58	n.a.	166.5	48.03	98.6	.268	2.87	67
1963	1	5.427	51.52	101.4	394.5	28.0	106.2	19.93	1.63	n.a.	169.2	48.08	98.3	.269	2.89	68
	2	5.537	51.64	101.2	400.0	29.4	106.6	21.24	1.70	n.a.	173.7	50.31	95.4	.138	2.99	69
	3	5.386	51.76	99.8	404.4	27.5	107.1	21.72	1.80	n.a.	178.3	51.72	96.2	.091	3.38	70
	4	5.616	51.88	102.1	410.9	26.4	107.6	22.20	1.70	n.a.	182.2	53.74	96.9	.209	3.52	71
1964	1	5.783	51.99	101.8												72
	2	5.946	52.11P	100.8												73

Source: See preceding section for explanation of symbols and source of data.

n.a. - Not available.

p - Predicted, based on present rate of increase.

Linear Multiple Regression

Linear regression appears to be the best approach to analysis since,

> Most of the relationships so far observed in the social sciences appear to be linear. Furthermore, it is not necessarily erroneous to apply product-moment correlation to data in which the line to best fit is moderately curved rather than a straight line. In such cases, r underestimates the degree of relationship, and prediction on the basis of the regression equation is not maximally effective.[1]

Only with substantial prior evidence that other than a linear relationship exists is there much to be gained from using the variables in other forms and can such usage be justified. The log form will be the only variation investigated in this study.

The step-wise multiple regression program used in this study on the University of Florida Computing Center 709 computer selects from the list of independent variables that one which is the most highly correlated with the dependent variable and fits a simple linear equation as the first step. In each succeeding step another independent variable is added and a linear equation fitted. The results of analyzing the consumer instalment sales credit data with this program are shown in Appendix C, preceded by a description of the program's method of selection.

As each X variable is entered and the net regression coefficients at that point are shown, as well as the standard error of the coefficients, their significance can be noted. At the .05 level of significance, if the coefficient is more than approximately two times the standard error of the coefficient, we can say that this variable is significant, based on the "t" distribution.

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[1] Philip H. DuBois, Multivariate Correlational Analysis (New York: Harper and Brothers, 1957), pp. 156-157.

Two general approaches to the interpretation of the step-wise multiple regression procedure can be employed. The first is a view, which can be taken at any step along the way or at the final step, of those X variables which by the aforementioned test can be shown to be significant in the equation with Y. Secondly, the results of the step-wise regression can be viewed by looking at the final effective step, realizing that the addition of an X variable which reduces the standard error of Y and increases the multiple correlation coefficient means that it has given some indication of a useful relationship to the Y variable. Therefore, from this standpoint, the final effective step shows an equation which could be used to show the best estimate of the total relationship indicated by the available data. This is based upon the fact that other evidence has already indicated a relationship of the X variables to the Y variable, and, therefore, we are studying this. The contribution of each X variable in the equation to the explanation of the variation in Y can be determined from the reduction of the standard error of estimate of Y resulting from the addition of that X variable and the improvement of the multiple correlation coefficient in the step in which the particular X variable was entered. Since the value of the constant in this multiple regression linear equation is shown at each step also, the determination of the equations can be complete.

Certain basic features of using this analysis should be specified. One is that any observation containing a missing X value cannot be used in a multiple regression incorporating that independent variable, since it would enter into the regression as a zero and distort the mathematical calculations. Therefore, only a full complement of variables for each observation used in the regression provides proper data for an analysis. This necessitates four different combinations of X variables in this study, since some are not available for all observations.

The primary example of the variable which unfortunately is not available for all observations is that of OPN, the index of consumer attitudes and opinions regarding the purchase of durables. The surveys of the University of Michigan Survey Research Center which provided the data for this index were taken on a quarterly basis which made them compatible with the basic design of this study. These were not conducted for all quarters, however, and did not start until the latter part of 1952. Thus, starting with the fourth quarter of 1952 and going through the fourth quarter of 1963, the end of this study, only 33 observations which include OPN are available.

The other factor which is not completely available is that of the stock of automobiles used for CSTA. The study conducted by the Division of Research and Statistics of the Federal Reserve Board provided data through 1961 and it has not been possible to obtain the necessary information to carry the series further. Therefore, a multiple regression analysis including CSTA could not include the eight observations of 1962 and 1963, leaving only 62 observations, and the use of this complete period would preclude the inclusion of OPN, leaving only nine independent variables. For a regression analysis which will include all ten independent variables in each observation, the restrictions of both OPN and CSTA allow only 25 observations to be considered. To consider the full period of 1946, third quarter through 1963, fourth quarter, or 70 observations, only eight independent variables can be used. Appendix A contains a description of the method of identification of the various regressions.

The following chapter analyzes the results of these regressions, using tables extracted from the print-outs, and thus provides a basis for the conclusions to be reached in the study.

CHAPTER VI

AN EVALUATION OF THE RESULTS OF THE REGRESSIONS

The multiple regression of economic time series data results in a description of the apparent relationship between the dependent variable and the independent variables under investigation in the period for which their values have been obtained. This necessitates an assumption that during this period the economy has undergone no appreciable change in structure which is not reflected in the variations in the independent variables. Further, to extend the use of the regression equation to any subsequent period requires the assumption that the same structure continues to exist, or, in other words, that the observations from which the equation was derived are from the same universe as the new period. Such may or may not reasonably be the case, dependent upon the soundness of judgment used in having evaluated the economic problem beforehand.

From another viewpoint, these observations may be considered to be the total universe which is being described, as accurately as possible, by the regression equation which results from the appropriate calculations involving all the observational values. If it is assumed, however, that all of the observations are drawn from the same universe, it still cannot be said that they are randomly selected in the usual sense. Aggregate economic data provide only one value possible for each observation. Whether the observations comprise a universe or a sample from a universe, the development of these values, nevertheless, is based upon numerous random factors and so they may be said to be "randomized by nature." To the extent that this is true, the error term, u, of the right side of the regression equation is a variable with a probability distribution centered at zero and having a finite variance, σ_u^2, and the usual error formulas will apply, since

> the error term is assumed to be composed of the agglomerate effect of numerous independent minutiae. We measure as many of these disturbing factors as possible, include them in our equations of the model as separate variances and dispose of all the remaining under the heading of "random disturbances," relying on the laws of probability to tell us what to expect from these neglected factors.[1]

Thus, the use of the standard error of estimate may be justified, but the justification is based partly on judgment.

Two basic methods are employed to counter the effect of serial correlation in the error term attributable to trend in the data. First, all variables have been corrected for changes in population and prices. Second, the use of the time factor as a variable in the regression has accounted for further variation attributable to trend and representing the influence of gradually changing factors in the structure of the economy, such as tastes and technology. This does not account for the presence of cyclical variations, which may affect the values of all of the variables under consideration, either directly or inversely. Even mortgage credit, generally considered in terms of the longer building cycle, would fall in the latter category, since factors associated with residential construction have appeared to move countercyclically in the postwar years.[1] The presence of the cycle in the data should contribute to an increase in correlation, if, as has been contended, consumer instalment sales credit is an intensifying factor in cyclical fluctuations. It may be concluded, therefore, that if the variables were first selected based on sound economic judgment and then properly treated to account for the serial correlation of trend, the judicious use of the standard error of estimate may be acceptable in viewing the results of the regression. Such a view has been taken in evaluating the results of this study.

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[1] L. R. Klein, An Introduction to Econometrics (Englewood Cliffs, N.J.: Prentice-Hall, 1962), p. 15.

Preliminary Considerations

Table 16 has been compiled from the output of the multiple regression program shown in Appendix C. The problem numbers with accompanying descriptions of the conditions for the regressions tested are listed, for reference, in Table 17. Before these regressions were selected and tested, however, some preliminary simple regressions were considered. The results of these trials served as a basis for determining "lags" to be assigned to independent variables and evaluating the use of the log form of some independent variables.

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[1] Bert G. Hickman, Growth and Stability of the Postwar Economy (Washington: Brookings Institution, 1960), pp. 303-304.

TABLE 16

SELECTED CORRELATION COEFFICIENTS FROM AUTOMOTIVE SECTOR REGRESSION ANALYSIS

		Simple Correlation Coefficients of Y (CACG) vs. Each X									
Problem Number	Multiple Correlation Coefficient	X(1) CYCU	X(2) CSLA	X(3) DURI	X(4) CSTA	X(5) CMRO	X(6) CTIO	X(7) OPN	X(8) FRS	X(9) TBR	X(10) TREND
204	.9591	.7719	.1759	-.8313	.9056	.7867	.8633	...	-.7387	.7292	.8852
404	.9121	.3373	-.1977	-.4587	.3821	.2004	.2804	...	-.5604	.3947	.1746
004	.9500	.8201	.2503	-.8533	...	.8304	.8909	...	-.6680	.7723	.8998
504	.9281	.5653	.0564	-.5746	...	.4826	.5356	...	-.3566	.4867	.4345
304	.9491	.2862	-.1249	-.3507	.2950	.1254	.2133	.5597	-.7387	.5603	.0845
104	.9573	.5909	.2071	-.5332	...	.4999	.5574	.5303	-.4905	.6470	.4348
014	.9191	.8102	.2701	-.8084	...	.8288	.8744	...	-.6110	.7396	.8909
005	.9597	.8201	.3606	-.8533	...	.8819	.9206	...	-.6680	.8215	.8998

Source: See Appendix C.

TABLE 17

REGRESSION CONDITIONS, AUTOMOTIVE SECTOR RUNS

Problem No.	Variables Not Used	Time Period	Log Transformations	Time Lag	Number of Observations
204	OPN	1946, third quarter through 1961, fourth quarter	TREND	None	62
404	OPN	1952, third quarter through 1961, fourth quarter	TREND	None	38
004	CSTA OPN	1946, third quarter through 1963, fourth quarter	TREND	None	70
504	CSTA OPN	1952, third quarter through 1963, fourth quarter	TREND	None	46
304	...	1952, fourth quarter through 1961, fourth quarter	TREND	OPN at T-1	25
104	CSTA	1952, fourth quarter through 1963, fourth quarter	TREND	OPN at T-1	33
014	CSTA OPN	1946, third quarter through 1963, fourth quarter	TREND	CACG (Y) T+1	70
005	CSTA OPN	1946, third quarter through 1963, fourth quarter	CSLA CMRO CTIO TBR TREND	None	70

Source: Appendix A and Appendix C.

Preliminarily, X(10), the TREND or time variable, was tested for its simple correlation with Y, using the various periods required for the final runs. It was found that the log transformation of X(10) consistently resulted in a better simple correlation with Y than did the untransformed variable. Lower coefficients than those of Table 16 for X(10) vs. Y were obtained from regressions which were identical in all respects except that X(10) was used in its original form. The comparable coefficient to the .8852 of problem 204 was .8067, using an untransformed value of X(10). Similarly, comparable to the .8998 of problem 004 was a value of .8455 when using X(10) in its original form, and comparable to the .0845 of problem 304 was a value of .0473 with X(10) in its original form.

Thus, trend appears to be present even after the price index deflators and consumer unit divisors have been applied. The above determination would mean that the upward trend of CACG may be one of smaller increments in each succeeding year, as is true in the equation:

$$Y = a + b \log X, \qquad \text{where } Y = \text{CACG and } X = \text{TREND}$$

Such a condition was logically the case in the life cycle of the industry. Increases due to growth in consumer units and the upward trend of consumer prices by the initial corrections to ACG have been eliminated and the rate of increase in the extensions of instalment sales credit aside from these factors might be expected to decline.

All X variables were preliminarily tested for the simple correlation of their log transformation with Y. The variables X(2), X(5), X(6), and X(9) showed sufficient degree of improvement in the correlation coefficient over that obtained with the untransformed variables to indicate that the transformation should be tested in a multiple regression. It is more difficult to theoretically substantiate any of these transformations, however. For example, the impression that X(9), TBR, might be rising at a more rapid rate than Y, CACG, is not easily inferred from a view of the institutional aspects of both variables. The analyses include, therefore, only a representative regression using these additional log transformations. The results will be compared below.

OPN was preliminarily tested for determination of the amount of lag which it had to Y. As was stated in Chapter V, it should be expected that this measure of consumer intentions would be predictive. The Survey Research Center has found it to be so for expenditures on durable goods.[1] Three preliminary simple correlation coefficients were determined for Y and OPN, X(7), in a series of regressions which were identical to problem 104 except for a change in the lag of OPN and the use of one additional observation (1964, first quarter, see Table 13 and the description of it preceding). When Y and X(7) were from the same quarter, the coefficient was .4480; when Y was from one quarter later than X(7), .5216; and when Y was from the second quarter after that of X(7), .4613. This bears out the assumption that OPN should be from one quarter prior. When it could be included, therefore, X(7) was read in from the time minus one period.

None of the other X variables evidenced the characteristic of having a higher simple correlation with Y when lagging it by one, two or three quarters. Nevertheless, problem 014 was undertaken to view the step-wise regression in which Y was associated with each included X lagged by one quarter, for a total comparison with problem 004, in which Y and all X's were in the same time period. (CSTA and OPN were not included because they were lacking in some observations.) The results of this regression will be discussed later as the predictive use of the independent variables is considered.

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[1] Survey Research Center, 1960 Survey of Consumer Finances (Ann Arbor: University of Michigan, 1961), p. 183.

Multiple Correlation Coefficients

As stated in the preceding chapter, the time period before 1952, third quarter, was influenced to some extent by Regulation W and the unusual postwar economic conditions. Therefore, the following period (1952, third quarter, through 1963, fourth quarter) was studied separately. Problem 304 considers all ten X variables in this period and, therefore, is restricted to 25 observations, since values for CSTA are not available for 1962 and 1963 and values for OPN are not available for each quarter preceding 1962. The multiple correlation coefficient is .9491. When CSTA, X(4), is not included with the other nine independent variables (problem 104), an additional eight observations can be added by including 1962 and 1963. The multiple correlation coefficient is .9573. When OPN is not considered with the other nine independent variables, on the other hand, in the period 1952, third quarter through 1961, fourth quarter (problem 404), the coefficient drops to .9121 for the 38 observations. When CSTA is also dropped, however (problem 504), leaving only eight independent variables, the additional eight observations (for a total of 46) once again contribute to a higher correlation of .9281. It appears, therefore, that the addition of the observations from the years 1962 and 1963 increases the correlation shown by the observations of prior years.

Both of the regressions which include the Regulation W period show an improvement in correlation over those which do not have observations from that period but correspond otherwise. Problem 204 with 62 observations (not including 1962 and 1963) has a coefficient of .9591. Problem 004, with the full period of 70 observations (CSTA as well as OPN not used), has a coefficient of .9500. Since the addition of observations from 1962 and 1963 accompanying the removal of CSTA, as noted above, has been seen to increase the multiple correlation coefficient, this reduction of .009 resulting from the removal of CSTA, although minute, is a reversal of that prior result and seems to indicate that the value of CSTA was particularly felt in the Regulation W period, when downpayment requirements were more rigid. Generally, the period including Regulation W appears to have higher correlation coefficients which may be attributable partially to the element of control.

Using the X variables as lagging variables in problem 014 resulted in a lower correlation coefficient than that obtained for the corresponding run in which Y was in the same time period as the X's (problem 004). After considering the regression equation and the standard error of estimate, a fuller evaluation of the predictive use of these variables may be made.

Since the use of log transformations for X(2), X(5), X(6), and X(9), has been indicated as the basis for a possible improvement in the multiple correlation coefficient, it was tried with eight variables in problem 005, comparable to problem 004 except for the added log transformations. Although these four had higher simple correlation coefficients with Y and the other four remained the same, the multiple correlation coefficient of problem 005 of .9497 was comparable to the problem 004 value of .9500.

The Regression Equations

Table 18 contains values, extracted from the print-outs found in Appendix C, for the final regression equations resulting from the analyses of all of the problems. These final values are taken from the last step of the step-wise regression or from the step at which the standard error of estimate was the lowest. On the basis of the variables tested, they provide, therefore, the most complete explanation possible of the variation in credit granted for each problem. In some cases the net regression coefficients would not be significant by the usual statistical tests of being two or three times as large as their standard errors. Rather than follow a hard and fast statistical approach, however, the view stated by Klein and Goldberger is observed of not "automatically rejecting equations in which some coefficients are not at least two or three times as large as their sampling error," but considering them if they do not "appear to have empirically unstable coefficients," as judged by theoretical hypotheses and other analyses.[1] The lack of significance would be an adverse factor in the full evaluation of the variable, however.

It appears that all of the independent variables theoretically associated with the quantity of automobile sales credit granted may, under certain conditions, significantly account for some of the variation in the dependent variable. In some cases an independent variable with a high simple correlation to Y does not appear in the final multiple regression equation, e.g., CYCU in problems 204 and 004. That is because of its high correlation with another independent variable which is present in the final equation, and this accounts for some apparent inconsistencies in the results. It has been observed that intercorrelation among independent variables masks the separate contribution of each and makes the model subject to indetermacy.[2]

In the evaluation of the use of log transformations of CSLA, CMRO, CTIO, and TBR (problem 005), two changes occur in the variables appearing in the final equation. CYCU is present in problem 005, while it is not in problem 004, where the same conditions existed except for the log transformations of the four variables indicated above. DURI appears in the final equation of 004, but not in 005, although it is not significant even in the former. Although there has been this shift in emphasis, the use of log transformations has decreased the standard

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[1] L. R. Klein and A. S. Goldberger, An Econometric Model of the United States, 1929-1952 (Amsterdam: North-Holland Publishing Company, 1955), p. 68.

[2] See Klein, p. 64; also Klein and Goldberger, p. 57.

TABLE 18

FINAL VALUES OF MULTIPLE REGRESSION ANALYSIS OF AUTOMOTIVE SECTOR (AT LOWEST STANDARD ERROR OF ESTIMATE OF Y, CACG)

Problem Number	Step Number	Standard Error of Estimate	Constant Term			Multiple
				X(1) CYCU	X(2) CSLA	X(3) DURI
204	7	6323.0	72430.	....	-0.08655 (0.07309)	-0.31936 (0.21599)
404	9	5111.8	638885.	3.5321 (2.1352)	0.44142 (0.21795)	-2.4255 (0.4468)
004	6	7258.4	43899.	....	....	-0.12696 (0.19654)
504	8	4887.8	468730.	5.5715 (1.4833)	0.54133 (0.17392)	-2.3366 (0.3971)
304	5	3738.2	46642.	....	0.39459 (0.17847)	-1.3771 (0.2050)
104	8	3985.9	354090.	....	0.65900 (0.16168)	-1.3398 (0.4211)
014	4	8752.6	23351.	....	....	....
005	6	7234.3	-13995.	2.8206 (1.4019)	....	....

Source: Appendix C.

TABLE 18 (Continued)

Regression Coefficients with Standard Errors Shown in Parentheses						
X(4) CSTA	X(5) CMRO	X(6) CTIO	X(7) OPN	X(8) FRS	X(9) TBR	X(10) TREND
0.43004 (0.21278)	-2.0202 (0.9746)	0.79153 (0.55960)	....	-18.905 (3.513)	-45.561 (21.322)	....
0.61452 (0.40242	12.336 (4.744)	-1.7778 (0.7313)	....	-13.290 (3.955)	-48.114 (23.668)	-232603. (64722.)
....	-1.7886 (0.9728)	1.1847 (0.4467)	....	-16.333 (3.464)	-41.515 (21.274)	4890.3 (3890.7)
....	9.0474 (2.3446)	-1.2396 (0.5577)	....	-14.496 (3.536)	-67.016 (20.152)	-201642. (28331.)
....	....	....	101.081 (19.461)	-21.134 (2.755)	-48.992 (15.166)	....
....	7.3334 (2.5984)	-0.14414 (0.53682)	87.795 (23.276)	-21.256 (3.287)	-61.592 (20.272)	-120769. (36371.)
....	....	0.43024 (0.15653)	....	-14.815 (3.732)	-48.950 (24.921)	12232. (3881.)
....	-75383. (32840.)	61251. (18303.)	....	-13.162 (2.984)	-6365.4 (4033.5)	6087. (13082.)

TABLE 19

EXPLANATION OF THE VARIATION IN Y BY X VARIABLES IN MULTIPLE REGRESSION ANALYSIS OF AUTOMOTIVE SECTOR

Problem Number	Standard Deviation of Y, CACG	Amount Explained by Each X Variable (Reduction of Standard Error of Estimate Resulting from Addition of Variable)										Remaining Variation (Final Standard Error of Estimate)
		X(1) CYCU	X(2) CSLA	X(3) DURI	X(4) CSTA	X(5) CMRO	X(6) CTIO	X(7) OPN	X(8) FRS	X(9) TBR	X(10) TREND	
204	21008	n.e.	23	510	12026	654	26	n.u.	1361	84	n.e.	6323
404	10844	311	55	1787	116	51	249	n.u.	1739	618	807	5112
004	22042	n.e.	n.e.	416	n.u.	34	122	n.u.	1503	256	12352	7258
504	11906	437	420	2052	n.u.	509	247	n.u.	1540	15	1798	4888
304	10345	n.e.	347	1359	n.e.	n.e.	n.e.	1156	3222	522	n.e.	3738
104	11799	n.e.	1288	725	n.u.	521	586	902	977	2658	157	3986
014	21506	n.e.	n.e.	n.e.	n.u.	n.e.	194	n.u.	706	188	11666	8753
005	22042	50	n.e.	n.e.	n.u.	43	13370	n.u.	1223	84	37	7234

Source: Appendix C.

n.u. - Not used.

n.e. - Did not aid in explanation.

error of estimate of Y very little and increased the multiple correlation coefficient at this step by a negligible amount, as previously noted. Judging by this regression, therefore, there is no substantial benefit to be obtained from using these log transformations.

Explanation of Variation in Y

Each variable which enters into a regression can be evaluated further in light of the specific contribution it makes in explaining the variation in Y. The values in Table 19 were obtained from the print-outs in Appendix C by subtracting the standard error of estimate of Y, with a given number of X variables, from the standard error which applied before the addition of the last X variable and attributing that amount of reduction to the variable entered in the current step. It should be noted, however, that of two highly correlated independent variables, the one with the higher correlation to the dependent variable will be chosen first in the step-wise regression and may exhibit a large reduction of the standard error. The other, when tested in turn, would reduce the standard error by a smaller amount or perhaps be excluded from the final equation, as noted in the previous section, whereas if chosen first it would have provided the substantial reduction of the standard error.

Regression Analysis Conclusions

While all of the independent variables theoretically associated with the amount of automobile instalment sales credit granted have shown some measure of empirical relationship, the variables for the stock of automobiles and consumer attitudes are not available for all observations, and, therefore, their effect for more complete periods must be inferred from the analysis of the runs in which they are present. Other than this, the contributions of each of the independent variables to the explanation of the variation in credit extension can be evaluated by considering its role in all of the regressions and noting any exogenous factors which may have influenced its appearance. Primarily, however, the discussion will center about the two models which are most significantly descriptive of the post-Regulation W period, those of problems 504 and 304. In 504, a complete set of observations (all quarters) was used for the full post-Regulation W period, but only eight independent variables were present (the stock of automobiles in the hands of consumers, CSTA, and the Index of Consumer Attitudes, OPN, could not be included). In 304, all independent variables were used and, therefore, the number of observations in the period was limited. The final equation in both cases contained only significant net regression coefficients. Problems 014 and 005 will not be considered in the basic discussion, since they involve special cases.

Demand Factors

The effect of disposable income on automobile instalment sales credit granted, while important, can be overshadowed by other factors related to it. In the two basic analyses which include the Regulation W period but do not incorporate consumer attitudes, disposable income does not appear in the final equation, whereas in the corresponding post-Regulation W regressions, it is significant, or nearly so. This conflict may result from the unique nature of the immediate postwar years. They were unusual from at least three distinct standpoints. First, pent-up consumer demand met the bottleneck of reconversion head-on, creating a chaotic market for all types of consumers' durables, especially automobiles. This sellers' market certainly took less cognizance of current disposable income as a factor than the period following the Korean conflict. Secondly, cash was more readily available from wartime savings than under more normal conditions, and this cash position had little relationship to current disposable income in many individual cases. Thirdly, Regulation W and pegged interest rates imposed an additional set of artificial conditions on the market. Disposable income does not appear at all in the final equations of the two post-Regulation W regressions containing consumer attitude, however, since in neither case does its entry reduce the standard error of Y. Its individual contribution to the explanation of Y is not significant because of its high intercorrelation with other of the independent variables, TREND, CMRO, CTIO, and DURI.

Consumer savings from the preceding year appears in all of the post-Regulation W regressions significantly, with and without the attitude index, and its contribution to the explanation of Y's variation is substantial with the attitude index present. Since this is essentially a predictive variable (although it was used with the current price index as a deflator to produce the present evaluation of real savings) it might be adapted for use in a regression such as problem 014 by using the value of savings at "time minus one year" when credit extended is at "time," instead of when credit extended is at "time plus one quarter," as it was in 014. Without the influence of the turbulent immediate postwar years consumer savings seems established as a significant factor in its own right.

The lack of significance of the stock of automobiles in both of the post-Regulation W regressions in which it is included, on the heels of its significance and large explanation of Y's variation in problem 204, indicates a greater relevance of the true value of used cars to the granting of credit in the immediate postwar period, when all cars were scarce, than in more recent years. Its loss of significance in problem 404 and exclusion from the final equation of problem 304 follows from the greatly reduced simple correlation with Y.

Residential mortgage credit outstanding is significant, or nearly so, in all basic regressions except 304. In this analysis, its simple correlation with credit granted is so low and intercorrelation with other independent variables so substantial that it lacks significance in the regression equation (to the extent that its inclusion would increase the standard error of estimate of Y). Nevertheless, it apparently can be an influential factor in credit extension, varying directly in the post-Regulation W era with instalment credit granted in both 404 and 504.

The change in sign for the net regression coefficient of mortgage credit from negative, for the longer segments which include the immediate postwar era, to positive, for those which begin in the latter half of 1952, is indicative of the unsettled characteristics of the earlier part of the period. The negative coefficient is significant, or nearly so, for these longer segments, and it seems, therefore, that the shortage of consumers' durables and the existence of substantial amounts of cash savings detracted from the extension of consumer instalment sales credit, while mortgage credit was growing more freely in the immediate postwar era.

The pattern of total instalment credit outstanding is similar to that of mortgage credit with the signs of the net regression coefficient reversed. While the net regression coefficient of instalment credit is positive for the longer segments which include the immediate postwar period and is significant in 004, it becomes negative for all of the shorter segments starting in the latter half of 1952. The direct relationship in the longer segment indicates the accelerating growth of credit in the immediate postwar years (the more outstanding, the more granted). After the initial resumption of credit expansion, the rate of increase declined steadily and fluctuations in credit granted became attuned to total credit outstanding in an inverse relationship. Under these conditions, as in 504, when total instalment credit outstanding rises, the granting of additional credit tends to fall, in a significant relationship and makes some explanation of the variation in Y. Once again, as in the case of mortgage credit, the simple correlation of total consumer instalment credit outstanding to credit granted is low and its intercorrelation with other independent variables (particularly mortgage credit) high in problem 304, where the Index of Consumer Attitudes is present, and thus total instalment credit does not appear in the final equation.

The embracing effect of the Index of Consumer Attitudes, which has been discussed, conforms to the substantial explanation of the variation in credit granted indicated for it in both of the regressions in which it appears. This variable, which was not available for the earlier part of the study, appears to supply a major factor in the demand for consumer instalment sales credit.

Supply Factors

The indicators of monetary policy, free reserves and Treasury Bill Rate, appear in all the regression equations. "Free reserves" has very significant negative net regression coefficients in every case. The existence of this inverse relationship reflects the characteristic employment of a tightening monetary policy (in the form of a reduction or slowed expansion of free reserves) at a time when consumer credit is expanding. Commercial banks do not respond to reductions in free reserves particularly by holding back on the expansion of consumer credit, and sales finance companies are not directly subject to tight money policy. Nor can they promote additional extensions immediately upon an increase in free reserves as part of a program of monetary ease.

The net regression coefficients of Treasury Bill rate are all negative also, and significant in all but one analysis, 004, where it is very nearly significant. This indicator of monetary policy, therefore, shows a net relationship which corresponds to the hypothesis of "tight money, reduced extensions."

Although it appears in all the basic regression equations, DURI, the index of the dollar value of monthly payments, does not account for as much of the standard error of estimate of credit granted or have a significant coefficient in those which include the Regulation W period as it does in the shorter segments. In all periods, however, it makes a substantial contribution to the explanation of Y's variation. This variable undoubtedly has an established relationship with credit extended under normal conditions (without unusual endogenous forces).

Time Factor

The final X variable, TREND, serves to explain the variation in credit granted in the regression which may be due to secular trend by incorporating the time element. The variables have been adjusted for price changes and put on a constant consumer unit basis where applicable, thus removing these aspects of trend, but a trend factor remains in most of the basic regression equations. The net coefficient of the time factor is negative for the post-Regulation W equations in which it appears. In problem 304 it has a very low simple correlation coefficient with Y, and this, coupled with high intercorrelations with other independent variables, lowers its contribution to a point where it does not enter the equation. In the regressions which include the Regulation W period, the time variable has a net positive coefficient, but the high intercorrelation prevents this from being significant. Thus, in the immediate postwar period, a sufficient amount of credit was granted to show a net upward trend, while the later years alone reveal a net downward trend.

Summary of the Supply and Demand Factors

For a full description of the explainable variation in automotive instalment sales credit granted at the present, it appears from problem 504, that disposable income, consumer savings, residential mortgage credit outstanding, and total consumer instalment credit outstanding should be considered from the demand standpoint; while the index of monthly payment, free reserves, and Treasury Bill rate should be considered from the supply side. Along with these, a time element denoting the variation in Y resulting from secular trend is needed. The use of the stock of automobiles might be inferred from other regressions, but, since it has not been available for 1962 and 1963, we have no direct basis for doing so. A tentative conclusion from problem 304 is that the Index of Consumer Attitudes encompasses this variable. Some aspects of current consumer disposable income, mortgage credit, total instalment credit and "time" also appear to be reflected in the Index of Consumer Attitudes. Without the Index in the regression, they aid in explaining the variation in credit granted, but it appears that the standard error of estimate of Y is substantially lower with the Index present. The Index thus may provide additional explanation of the intentions of consumers over that which some appropriate financial variables themselves can make.

The equation best expressing the relationship of the appropriate independent variables to automotive instalment sales credit granted for the postwar period are then:

1. From problem 504

$$\begin{aligned} CACG = {} & 468{,}730 + 5.5715\ CYCU + 0.54133\ CSLA - 2.3366\ DURI \\ & + 9.0474\ CMRO - 1.2396\ CTIO - 14.496\ FRS - 87.016\ TBR \\ & - 201{,}642\ TREND \end{aligned}$$

2. From problem 304

$$\begin{aligned} CACG = {} & 46{,}642 + 0.39459\ CSLA - 1.3771\ DURI + 101.081\ OPN \\ & - 21.134\ FRS - 48.992\ TBR \end{aligned}$$

Predictive Value

If the above models of the role of consumer instalment sales credit in the economy were to be used to predict the value of credit granted for the coming quarter, the values of all independent variables (with the exception of OPN) would require estimation, since they do not lag the dependent variable. As this would involve added introduction of error into the estimate of CACG, the confidence interval for such an estimate would be greater than that normally determined from the error formulas. In order to approach the question of prediction in a manner which would allow the standard error of estimate to be used as the sole determinant of the confidence interval, problem 014, with all independent variables lagged was tested.

Although the analysis of 014 shows it to lack precision by comparison with 504 and 304 above (the standard error of estimate for problem 014 was 8752.6 compared to 4887.8 for 504 and 3738.2 for 304) it provides a reliable confidence interval, and allows the use of actual independent variables, rather than estimates, for the determination of CACG of the next quarter. An example of its use is presented for illustration. The equation of 014 is:

$$\text{CACG} = 23{,}351 + 0.43024\ \text{CTIO} - 14.815\ \text{FRS} - 48.950\ \text{TBR} + 12{,}232\ \text{TREND}$$

CACG is at "time plus one," while all X variables are at "time." TREND and CTIO have reversed signs in this analysis of the complete postwar period from those of the post-Regression W period, as discussed above.

In testing it for "time" = 1964, first quarter:

CTIO = 95,993

FRS = 98

TBR = 354

TREND = $\log_e 72 = 4.27667$

CACG (predicted by the equation) = 98,184

CACG (actual for 1964, second quarter) = 113,199

Based on ± two times the standard error (.05 level of significance), the confidence interval is 98,184 ± 17,505 or 80,679 to 115,689. Thus the actual value falls within this range of prediction. Since the range is ± 17.8 per cent of the point estimate, however, it lacks sufficient precision to form a basis for very effective decisions regarding future actions. The future use of the index of Consumer Attitudes (OPN) in such an equation might aid in obtaining a more precise estimate.

CHAPTER VII

SUMMARY AND CONCLUSIONS

The Role of Consumer Instalment Sales Credit

The development of the institution of consumer instalment sales credit in the United States has been concomitant with the growth of the economy, and it has been held by many that the latter could not have been successful without the availability of the former. Its present secure position in the structure of our economy has been challenged, however. Sales finance has been characterized by some as an additional tool of the producers of consumers' durables in a continuing effort to place their output, needed or not, in the hands of the uninformed consumer. When this evaluation is viewed in the light of the theoretical economic concept of consumer instalment sales credit as an intensifying factor in business cycles due to its destabilizing characteristics, its role becomes much more significant in the overall study of economic fluctuations in the United States.

Contribution to Cyclical Fluctuations

For the purpose of evaluating its effect on the economy with the Keynesian model, the use of instalment credit by consumers for the purchase of durables can be likened to investment by entrepreneurs. The expectations of consumers lead to their decisions regarding the obligation of future income to repayment for the present utility of additional, more satisfying, or beneficial durable goods.

When expectations are optimistic, it is because consumers anticipate future returns to be substantial in the form of continued employment with rising income. This is enhanced by the euphoria resulting from an atmosphere of social and political security. Under such conditions, consumers will substitute durables for less elegent, efficient or pleasant means of performing tasks, they will advance the purchase of replacement durables, and they will obtain others for purely hedonistic pursuits. All such acquisitions will be encouraged by the producers of consumers' durables and made possible by the suppliers of instalment credit.

When expectations become pessimistic, on the other hand, because of doubts concerning future income or stability of the economy, consumers continue to use (or return to using) means of transportation, methods of performing household chores, and other similar devices which are substitutable for the purchase of durables. They postpone the purchase of replacement durables if the present equipment can still be used (perhaps with repair), and are chary regarding the purchase of durables which do not clearly represent overall cost reductions.

Thus the movement of the cycle in general business, to which these optimistic and pessimistic attitudes show some relationship, calls forth reinforcement from the consumer instalment sales credit sector. After an increase in consumer "investment" in durable goods provides an initial increment to the GNP, the multiplier effect produces the secondary addition which follows. Induced investment by producers of consumer goods comprises the tertiary effect. Not only does the pessimistic attitude result in the reverse of these three effects, but a further reduction in consumer demand occurs on account of the repayment of consumer instalment credit, incurred in optimistic periods, out of reduced income of the contraction phase. In order to meet these obligations, consumers must cut down their current consumption expenditures by a greater percentage than that necessitated by the reduction in income. Thus cyclical fluctuations can be reinforced and accentuated considerably by the extension of credit in the sector which is a substantial and volatile part of the consumers' budget, the purchase of durable goods.

One purpose of this study has been to relate consumer instalment sales credit to cyclical fluctuations, not directly through an analysis of the credit extension time series, but by relating it to the cyclical elements of the economy through the multiple regression analyses which have been described and evaluated in the preceding two chapters. This does not mean that the analyses have shown a quantitative causal relationship between consumer instalment sales credit and cyclical fluctuations. Rather, it identifies the forces which significantly cause fluctuations in consumer instalment sales credit.

All the independent variables which affect the extension of this credit have been brought together in appropriate equations, shown to have a high correlation with the dependent variable (extensions), and the net effect of each on the variation in extensions evaluated.

Some of these independent variables, disposable income, consumer savings, and total instalment credit outstanding, are almost completely cyclically oriented. Some are partly subject to exogenous effects and partly cyclical. Consumer attitudes fall in this category, since the influence of such things as technological and style changes condition the consumers' responses, as well as endogenous financial elements. Residential mortgage credit outstanding may be partly cyclical and partly exogenous also. It is influenced by other endogenous factors such as savings, disposable income, and total instalment credit, but it is also affected by the movement of the longer building cycle. Finally, there are those factors which are partly cyclical and partly subject to direct control. Free reserves and Treasury Bill rate currently fall in this category, and the index of monthly payments formerly did and potentially does.

The relationship between consumer instalment sales credit and cyclical fluctuations, therefore, is subject to some control through factors which have been shown to significantly cause fluctuations in credit extensions. This control of cyclical fluctuations in the economy will be effective to the extent that consumer instalment sales credit influences aggregate demand, through the multiplier and accelerator effects described, in a countercyclical manner.

Conclusions from the Regression Analyses

To evaluate the role of consumer instalment sales credit in the economy and its relationship to monetary policy, as shown by the regression analyses, it was necessary to establish the bridge between the automotive area and the total sector of consumers' durables. The automotive area epitomizes all the volatile characteristics of the total sector and represents over 60 per cent of the dollar volume of consumer instalment sales credit outstanding (see Table 2). Although the Index of New Car Prospects[1] may prove to be a refinement for future Analysis of the automotive area, the Index of Consumer Attitudes is particularly suited for the complete durable goods area; and any other one area of consumers' durables analyzed in a similar manner to this which was used for the automotive sector should produce comparable results.

The results of the present study have shown that a variety of forces affect the aggregate extension of instalment sales credit to consumers. Some of these involve the supply of credit; a number of others the demand for it. The structure of the institution of consumer instalment credit and the economic factors which support this structure are well established, and, while subject to secular change, will not deviate sharply from the present patterns in the foreseeable future. The short-run fluctuations, however, can be severe, may influence the total economy by reinforcing the cycle in general business, or may cause disrupting cyclical behavior in individual areas of the consumers' durables sector.

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[1] Survey Research Center, 1963 Survey of Consumer Finances (Ann Arbor: University of Michigan, 1964), p. 171. This Index was not used in the analyses because not enough observations were available.

Consumers are generally not aware of any of the implications of their disrupting actions. When economic conditions are favorable, as indicated by the financial variables of supply, and when their attitude toward buying is favorable, because of propitious psychological factors and evaluation of the financial conditions and exogenous forces, such as governmental activity or style changes, they will want to use instalment credit to acquire durables, the payment for which they anticipate being able to make at future intervals. Contingent upon the conditions of supply, they will be able to satisfy these desires to some degree. Thus the quantity of consumer instalment sales credit granted is determined.

Factors Affecting Demand Psychologically and Financially

It is difficult to separate the financial aspects of the consumers' decisions in considering the independent variables which affect credit extensions. Whereas disposable income provides the wherewithal for payment and thus fulfills a financial requirement, the level of income buoys or depresses expectations as it exceeds or fails to meet anticipated or desired amounts. From the results of the regression analysis it appears that incorporating the Index of Consumer Attitudes in the regression may obviate the need for considering disposable income as a separate factor, since, in addition to other aspects of demand, the Index reflects the psychological reaction of consumers to changes in disposable income and anticipation of future amounts.

Similarly, the stock of automobiles in the hands of consumers may affect their attitudes toward buying directly, as well as affect their buying decisions on a financial basis because it represents a means of partly financing the new car purchase. From the standpoint of the consumer, the desire for or need of a new car, as evidenced by a lower stock of automobiles, may be sufficiently significant to offset the lower downpayment which it represents. The downpayment requirement for new automobiles reached 33 per cent under Regulation W. Such has not been the case in subsequent years. Were downpayment a more important consideration, as it was under Regulation W, the stock of cars could assume greater financial significance.

Past savings, mortgage credit outstanding and total instalment credit outstanding all have a basic financial effect on the consumers' evaluation. As indicated by the regression analyses, the effectiveness of past savings in explaining the change in credit extensions is not lessened by the introduction of the Attitudes Index. Apparently the attitude of consumers is not particularly concerned with the financial assets retained from a prior period. Mortgage credit and total instalment credit, on the other hand, do appear to have some present psychological effect on consumer attitudes, since the inclusion of the Index lessens their significance.

Supply Factors and Monetary Policy

A picture of supply has been drawn, which portrays a well-organized, competitive sector with a generally lower risk situation than other industries. Because of the lower risk, funds are usually more readily available to and through these suppliers. The response of this sector to changes in monetary policy, as evidenced by the relationship of Treasury Bill Rate and free reserves to credit extensions shown by the regression analyses, appears substantial, however, and provides evidence of the degree of effectiveness of quantitative monetary policy in this area. Once again, however, it must be observed that the intercorrelated cyclical movement of the variables, notably free reserves, the Treasury Bill rate, and credit granted, contribute to this relationship, and a purely causative effect of monetary policy on credit granted cannot be assumed from the analyses. The potential effect of a selective control of the Regulation W type is revealed by the effect of the index of monthly payments on credit extensions. Determining the effect of each of these two approaches to control has been another goal of this study, and the problem can be evaluated in the light of the findings.

Future Application of the Study

The question now to be considered is how to apply the results of the study to the clarification of and efforts to improve the role of consumer instalment sales credit. The use of the models of Chapter VI in predetermining a volume of extensions, by applying the independent variables to the appropriate equation, immediately presents itself as a possibility.

It must be quickly noted that while the necessary steps were taken in this study to provide the most reliable basis for such application, the statement at the beginning of Chapter VI regarding the questionable true random nature of the dependent variable and selection from the same universe qualifies any such application which employs the usual error formulas for confidence intervals. The value of such predictive use is limited, therefore, by the qualification. Secondly, intercorrelation between the independent variables has concealed their true relationship to credit granted to some extent.

A third limitation arises from the translation of the results of the study of one area to the total sector of consumers durables. The automotive area may be at variance with others of the consumers' durables sector and their response to changes in policy may tend to offset the desired change in automotive extensions. Since any selective policy action may logically result in the reallocation of funds, resources, and interest, the results for the total economy are not completely predictable. They tend to change the universe, which is assumed, as a first approximation, to be unchanging.

Nevertheless, the cautious application of the models may be useful in applying monetary controls. It is this area which remains to be considered.

The Problem of Control

Any attempts to control instalment sales credit must be concentrated on the supply side. The consumer is not particularly subject to moral suasion, since he may not be aware of any fault in his evaluation. For one thing, some growth in instalment sales credit can take place with little or no change in the consumer's budget. Monthly payments for the automobile take the place of taxi, bus, and train fares. When his budgetary allotments are increased, on the other hand, due to sales financing, they are in relation to his total evaluation of the economic scene and thus still seem justified.

Fiscal policy has had some influence on the supply side by acting through these financial variables, influencing the amount of cash purchases and inversely the amount of credit granted.[1] Fiscal policy, however, is not adaptable to fine control, is subject to long lags, and any influence such as described above is more of a by-product than a direct cause-and-effect action.

If it were possible to decide upon the control of consumer instalment sales credit abstractly by selecting a sufficiently efficacious means to produce the desired level of credit outstanding or volume of new extensions, the task of doing so would present much less difficulty. This idealistic view bears little resemblance to the actual problem, however.

Experience with Regulation W in controlling downpayments and maturity times provides a basis for evaluating its effect on this sector. The degree of latitude in the use of the general instruments of monetary policy necessary to influence consumer instalment sales credit sufficiently to achieve desired results might also be ascertainable. In addition, another area of control, production, could be considered.

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[1] Wall Street Journal, October 6, 1964, p. 5.

Obviously, of course, the abstract approach would initially encounter the problems of the cost and difficulties involved in implementing each of these methods. Any such approach would require general public acceptance to be workable and effective. Lack of support for it could be due to infringement on the previously accepted rights and privileges of the public or the excessive cost inherent in the means of control. Involved administrative procedures could in general lend disenchantment to a concept of control which may theoretically and abstractly perform its task effectively.

Even more significant reasons exist, however, for further evaluation of any seemingly effective control measures. The impact beyond the scope of consumer instalment sales credit per se of, e.g., the extreme use of general monetary control measures to limit greatly excessive rises in the amount of credit granted, could be so great as to make the original fluctuation in the consumer durable goods sector pale by comparison. Essentially what must be observed is the macroeconomic view, a consideration of the aggregate economy. Shifts in the level of production in the consumers' durable goods industry have regenerative and pervasive effects on the whole economy as the multiplier and accelerator mechanisms run their course. And changes in the money supply initiated by overall monetary policy decisions impinge upon every element of the economy while producing a given desired result in one.

General Controls

Thus any manner of control must be somehow evaluated not only for its ability to minimize detrimental fluctuations in consumer instalment sales credit, but for the disadvantages of its side effects, both the quantitative and qualitative (such as restriction of individual freedom). Some will tend more toward quantitative considerations and others the qualitative. The former applies to the general instruments of monetary policy. The Federal Reserve Board study of 1957 produced a consensus that general controls are not very powerful in the consumer instalment sales credit area. This, of course, refers to the fact that their use is limited by the total view of the economy and the phase of the cycle in general business. Another way of stating this is to say that were they used in a manner rendering them powerful enough to have the desired effect on consumer instalment sales credit, this would be disruptive to the economy as a whole, the very thing supposedly being protected.

Some economists appear to believe that Hawtrey's statement, "Short of an absolute refusal to lend there is much that bankers can do to restrict credit,"[1] can apply to consumer instalment sales credit to a reasonable degree. This requires much amplification. The question is not so much can they but will they and in what areas do they first apply restrictions. James C. T. Mao concludes that consumer credit is not immune to general credit controls,[1] but this is a far cry from considering them sufficiently responsive to these Federal Reserve Board policies. Thomas Nixon Carver stated that, "Consumers cannot buy any more on credit than for cash *except* during the period when credit is expanding"[2] (italics mine), but the control of this expansion cannot be easily assumed. What he and others have not sufficiently considered is the supply situation discussed in Chapter III. The supply of funds for consumer instalment sales credit furnished by sales finance companies comes from a variety of sources, only one of which is directly subject to monetary control, and the reallocation of funds by banks under tightening money conditions does not tend to cut off the supply of consumer instalment sales credit at an early point.

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[1] R. C. Hawtrey, Currency and Credit (4th ed.; London: Longmans, Green and Co., 1950), pp. 23-24.

The regression analyses have indicated that variations in monetary policy (as viewed through free reserves and Treasury Bill Rate) account for part of the variation in credit granted. It can be determined from Table 19 that in problem 304 the two indicators of monetary policy accounted for approximately 37 per cent of the variation. This is a substantial portion in this comprehensive regression, but the other variables together account for a greater amount. If, after correcting the variables for price changes and population increases and including the time element to account for variation due to trend, where applicable, an objective of monetary policy was to restrict any further movement in consumer instalment credit granted, it would not be possible to do so, based on past experience.

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[1] James C. T. Mao, "Is Consumer Credit Immune to General Monetary Control?" *Michigan Business Review*, XIII, No. 1 (January, 1961), 28.

[2] Thomas Nixon Carver, "Consumer Credit and Economic Stability," *The Annals of the American Academy of Political and Social Science*, CXCVI (March, 1938), 97.

It is possible, however, for monetary policy actions to have considerable latitude in being able to dampen fluctuations in consumer instalment sales credit granted and thus (through the multiplier and accelerator) exercise considerable control over cyclical fluctuations in the whole economy. The question remains, is this sufficient to provide for all eventualities of credit granted fluctuations, when the many aspects of the operation of our economy are considered, over which the general instruments of monetary policy are called upon to exercise control.

Selective Control of Regulation W

Recognition of the possible insufficiency of quantitative measures by Nugent meant to him that the control of consumer instalment sales credit, in order to restrain its detrimental effect on the business cycle, must be accomplished in a selective manner. The method which he was later able to introduce in wartime, due to the exigencies of the situation, he first envisioned as a normal peacetime measure. The downpayment requirements and minimum-times-for-payment provisions of Regulation W have since been espoused by some for continued use in peacetime, but opposed by many others, among them the business community in general. Immediately after World War II the advocates of these selective controls prevailed in their attempt to aid in providing a smooth transition to peacetime production, and Regulation W was kept in force, hopefully until the supply of consumers' durables would be able to catch up with demand. Although the demand for consumers' durables continued to outstrip supply, the controls were eased in 1946 as a result of pressure of public opinion, and terminated late in 1947. In mid-1948 Regulation W was again put into operation as an anti-inflation measure, but it was terminated in mid-1949 as a recession became evident. It was finally employed during the Korean conflict, being reinstated in September 1950 and allowed to expire in June 1952.

Its use as an anti-inflation measure has, therefore, been in the foreground of the thinking of many of its adherents. Others who favor its use still view it as a means of helping to control the business cycle.

In peacetime it is the intention of these advocates of Regulation W that these controls be maintained at least as a standby measure for use, if necessary, in forestalling an incipient boom by dampening demand and thus lessening the amplitude of our economic fluctuations.

The opposition generally can be divided into three categories: First, the belief that control is unnecessary; second, the belief that this type of control will not be effective; third, the opposition to government controls generally. Some opponents, of course, combine these areas in one form or another in developing their rationale. Little of the pre-Keynesian argument discussed in Chapter I, that consumer instalment sales credit merely "clears itself" in the future, is found in any form today, and thus the first area does not have adherents on this count alone. Rather the argument is coupled with the much stronger belief of area two, that the implementation of control to minimize economic fluctuations caused by consumer instalment sales credit would not get to the root of the problem since so many other factors influence the cycle in general business. And while not completely solving the problem at hand, these selective controls might prove too troublesome for the little good they do.

As Dauer has stated:

> As an anti-inflation device, consumer credit control is a pitifully weak weapon in the face of mounting defense expenditures and administration-encouraged wage-price spirals. Consumer credit control has been a politically acceptable device which gives the appearance of grappling with the problem. One of its chief dangers lies in deluding congress and the public into believing that it and the other half-way measures adopted to date constitute effective controls.[1]

This argument carries the seeds for its own answer. Consumer credit controls may have been weak, but they can be made as strong as the situation demands. In the face of increasing demand for durables from the recipients of inflated wages, stringent credit controls of the Regulation W type may provide the only feasible means of breaking the spiral.

Other opponents add the third factor to their argument against selective control, that such a measure in peacetime represents another step in the "creeping socialism" tendency of the federal government to usurp individual prerogatives in areas previously "freely competitive." Admittedly some such opposition stems from individual views which have a preconceived bias irrelevant to the problem of consumer instalment credit expansion. The difficulty in attempting to refute the arguments, however, lies in the inability to anticipate all the ramifications of re-establishing such controls.

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[1] Ernst A. Dauer, "The Effect of Consumer Credit on Business Fluctuations," University of Illinois Bulletin, XLVIII, No. 76 (June, 1951), 160.

Viewing the experience with Regulation W, Shay feels that this approach "can provide effective restraint upon the volume of consumer credit. Yet the extent to which this restraint can be relied upon to produce a strong effect remains unknown."[1] Other advocates of the use of this instrument by the Federal Reserve Board to complement the traditional monetary control devices also note its problem areas. Mors, while endorsing the fact that its impact is close to the demand side and speedier than the traditional bank controls operating completely on the supply side, points out the difficulties involved in its administration. Although he feels that Regulation W was successfully administered and that this type of control would be useful, he does not minimize the burden on businesses, the inequities among consumers and the problems of enforcement application.[2]

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[1] Robert Paul Shay, Regulation W: Experiment in Credit Control, University of Maine Bulletin, LV, No. 11 (April, 1953), 170.

[2] Mors, pp. 70-72.

While supporting the Regulation W type of control its advocates reveal the need for the support of the general public if it is to be successfully applied in peacetime. The reluctance of legislators to consider the reimposition of this measure may indicate an accurate appraisal of the need for it balanced against the degree of acceptance to be expected.

The empirical implications of this type of control may be seen by turning again to the regression analyses. The variable DURI, as has been discussed, represents the effect of downpayments and length of contract and thus monthly payments. It significantly explains a portion of the variation in credit granted in the regressions of the post-Regulation W period. In the longer runs which include the immediate postwar period of Regulation W, the significance of DURI is indicated in early steps but is lost later. This results from its high correlation with other independent factors which overshadow it in the unsettled early postwar days, and is, therefore, no indication of a lack of effectiveness on the part of Regulation W. Since the variable can explain approximately 13 per cent of the variation in credit granted in normal times (see problem 304 in Table 19), extreme changes in terms of the contract under a Regulation W type of control in peacetime may effect substantial changes in credit granted, which may effectively be used to supplement general credit controls. This may be at a time when it may not be feasible for the latter to be sufficiently diverted from the control of other areas of concern to properly bring their weight to bear on any one sector.

Other Alternatives

In addition to the lack of enthusiasm for controls, which has been observed, among those advocating some additional regulation we see the question appearing, as indicated by Shay, as to whether they can be applied swiftly and strongly enough to be made effective. Other means of control, while not more palatable, might evade the type of criticism leveled by Dauer against Regulation W, that it is too weak and ineffectual. Mitchell indicated his feelings in urging that the government be oriented to a great concern for consumption saying, "This will mean production for use, not for profit, which will require the socialization of the economy."[1] Other proposals less stringent than total control over production have been advanced. Meade suggests a tax on instalment payments for consumers' durables during booms and a subsidy during depressions.[2] Friedman, while not favoring controls for consumer instalment sales credit at all, offers, "A better technical device than either (consumer credit control or general credit control), so far as this argument alone goes, would be a tax on all forms of durable goods that could be imposed at a variable rate at the discretion of the same authority as the one charged with consumer credit control."[3] Another selective approach could be aimed at control of commercial bank loan portfolio distribution among borrowers, in order to direct the effect of general monetary policy.

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[1] Broadus Mitchell, "Brief for the Consumer," The Annals of the American Academy of Political and Social Science, CXCVI (March, 1938), 12.

[2] James E. Meade, Consumers' Credits and Unemployment (Oxford: Oxford University Press, 1938), pp. 18-20.

[3] Federal Reserve Board, Consumer Instalment Credit, Part II, Vol. 2, p. 83.

The Problem of Control Restated

The choice of any selective form of control over consumer instalment sales credit to aid the general controls in lessening the impact of credit extensions on economic fluctuations seems to be a difficult one. Side effects, administrative difficulties, lack of effectiveness, extreme curtailment of economic freedom and acceptance by the public must all be considered if any measure is to be adopted. It seems fruitless to rely on moral suasion when we view the past history of manufacturers in these fields. The automotive industry, for one, has always shown the desire to supply all that the consumer will take at any given time. If control of consumer demand through moral suasion is not feasible, then consideration of the Regulation W type of restrictions seems indicated for additional protection against potential sizeable maladjustments in the consumers' durables sector. The imposition of such additional control could be held in abeyance, and used only if corrective action by the general application of monetary policy and the normal forces of supply and demand be less than necessary to prevent the acceleration of an economic disruption in production and sales.

The large and growing areas of the economy directly connected with the use of consumer instalment sales credit are sufficient to warrant concern over the impact on cyclical fluctuations related to variations in this credit. The demonstrated relationship of credit extensions to the volatile elements of consumer demand and credit supply leads to the conclusion that appropriate action to limit the compounding and accelerating effect of these credit movements should be in the forefront of any plans for a more stable economy.

APPENDICES

APPENDIX A - PROBLEM NUMBER IDENTIFICATION

APPENDIX B - PRINT-OUT OF INPUT DATA FOR REGRESSIONS OF AUTOMOTIVE VARIABLES

APPENDIX C - PRINT-OUTS OF RESULTS OF MULTIPLE REGRESSION ANALYSIS OF AUTOMOTIVE SECTOR

APPENDIX A

PROBLEM NUMBER IDENTIFICATION

In the use of the multiple regression program, standard procedures are followed as recommended by the program instructions. The problem number was assigned based on the conditions specified. It is shown in three digits. The third from the right is used to describe the time period involved. A zero in this column indicates the full time period of 1946, third quarter, through 1963, fourth quarter. A one in this column is the period of OPN value, 1952, fourth quarter through 1963, fourth quarter, but with observations included for only those quarters in the time period when the OPN variable was available (33 observations). A two in this column is the CSTA period only, 1946, third quarter, through 1961, fourth quarter. A three is for the CSTA-OPN period only, i.e., 1952, fourth quarter, through 1961, fourth quarter, but with observations included for only those quarters in the time period when the OPN variable was available (25 observations). A four indicates the CSTA period starting with 1952, third quarter, and extending through 1961, fourth quarter. This has been set aside because it represents the period without any selective control. Regulation W was in operation to some extent up to that point in the study. A five in this column is for 1952, third quarter, through 1963, fourth quarter, or the period after controls in which eight X variables (not CSTA or OPN) can be considered.

The second digit from the right indicates any time lag. A zero indicates that the Y variable is that value which applies to the same time period as the X variables. A one in this column indicates that Y is at time plus one period, e.g., a reading for X(1) for 1947, first quarter, would be matched in the regression with the reading of Y for 1947, second quarter. Similarly, a two in this column would indicate that Y is at the time plus two period.

OPN is expected to be used as a predictive variable, since it represents a measure of the future intentions of consumers. Other X variables may not be applicable in this manner, since the Y financial variable may be tied more closely to concurrent financial X variables. Therefore, the OPN variable alone will be at time minus one unless noted otherwise.

The first column on the right indicates any transformations in the variables which took place. Preliminary correction factors will have been made prior to entry into this program, as has been described. Thus, e.g., STA enters the multiple regression program as CSTA (corrected stock of automobiles). A one in this column indicates no transformation of any of the variables read into the program. A four in the right-hand column indicates that X(10), the trend variable, will undergo a log transformation before it is used in the regression equation. A five indicates that other X's will undergo log transformations, as indicated in comment cards.

APPENDIX B

PRINT-OUT OF INPUT DATA FOR REGRESSIONS OF AUTOMOTIVE VARIABLES

Input data for the regressions described in Chapter V and analyzed in Chapter VI are shown in the two pages following. The columns are identified from left to right as follows:

Column 1 - Last two digits of year and number of quarter, e.g., 461 is 1946, first quarter.

Column 2 - CACG, Y

Column 3 - CYCU, X(1)

Column 4 - CSLA, X(2)

Column 5 - DURI, X(3)

Column 6 - CSTA, X(4)

Column 7 - CMRO, X(5)

Column 8 - CTIO, X(6)

Column 9 - OPN, X(7)

Column 10 - FRS, X(8)

Column 11 - TRB, X(9)

Column 12 - TREND, X(10)

Column 13 - Weight (disregard)

```
461       60950138008       13101  7932 10644           505   38   0   1
462       61174128435       13896  8180 12092           816   38   1   1
463 20715 58382 96104 89715 14684  7846 12525           736   38   2   1
464 25072 56067 64194 78445 15473  7853 14238           743   38   3   1
471 30805 55241 54440 81467 17274  8082 15396           698   38   4   1
472 32729 54072 49725 78480 18942  8364 17453           650   38   5   1
473 32204 53750 35061 78943 20561  8389 18062           798   80   6   1
474 40099 53713 33475 67892 22178  8581 20389           762   95   7   1
481 43641 54258 24443 66447 23767  8932 21667           552  100   8   1
482 42435 53332  2555 63408 24713  8803 22435           752  100   9   1
483 43090 54733 14463 60825 26810  9131 24247           756  109  10   1
484 39568 55173 12877 62996 28307  9529 25755           663  115  11   1
491 42337 54133 13762 69017 30580  9777 25719           546  116  12   1
492 50922 53347 32469 61416 32923  9968 27883           658  116  13   1
493 51529 52642 40733 61912 35255 10268 29871           847  106  14   1
494 57462 53159 37544 60092 37546 10694 32964           685  110  15   1
501 60442 56421 32888 57327 40642 11057 33711           655  114  16   1
502 61804 55914 25402 54874 43744 11445 36373           700  117  17   1
503 66553 56463 21956 52411 46851 11710 39169           669  132  18   1
504 52209 56904 13975 54991 49908 11918 38762           885  137  19   1
511 53177 55630 38663 57495 51314 11929 36577           471  142  20   1
512 56892 56733 29780 64997 52757 12290 36442           664  145  21   1
513 63335 56892 14478 74287 54202 12581 36871           383  163  22   1
514 62104 57177 43226 75871 55638 12746 37553           169  173  23   1
521 62137 56729 20207 74928 56094 13134 37039           578  159  24   1
522 74080 56292 50364 71275 56583 13277 39978           130  170  25   1
523 65885 57793 49950 66012 57046 13754 42639            95  171  26   1
524 80802 58539 49083 58151 57507 14123 46677   966    -870  209  27   1
531 84433 59730 42165 57509 59370 14553 48550  1000    -614  201  28   1
532 76492 59943 42748 51587 61296 14926 51274           365  211  29   1
533 73360 59633 50938 52910 63203 15305 52880   923     250  179  30   1
534 74298 59578 43675 48414 65141 15737 54593           252  160  31   1
541 63265 59793 45029 54396 66415 16020 52518   936     503  103  32   1
542 66161 59402 46147 54423 67491 16457 52975   951     711   64  33   1
543 75385 59885 46337 49188 68594 17100 53628   987     708  101  34   1
544 76595 60721 50757 51163 69667 17788 55386           457  114  35   1
551 93113 61733 49143 50827 72300 18370 56280           122  128  36   1
```

```
552104543 63334 42611 44807 74826 19140 60470  1042   168   141    37     1
553113863 64051 41517 42381 77331 19720 63728        -286   207    38     1
554 95488 65007 40658 44869 79810 20237 66408  1026  -245   254    39     1
561 96437 65039 32908 44286 80320 20750 66319        -409   225    40     1
562 90251 64120 39207 41882 79307 20639 66212   993  -195   249    41     1
563 90452 65725 37404 44728 81669 21507 68485   998  -214   284    42     1
564 82135 66108 43587 48441 82337 21793 69828  1003   -36   321    43     1
571 91658 66024 41401 47010 82896 22030 68421        -316   308    44     1
572 91014 66337 49194 46087 83452 22212 69688   944  -508   329    45     1
573 95075 67943 53885 43784 85824 22966 72136        -466   353    46     1
574 85352 67157 53302 46353 86398 23220 73091   860  -133   304    47     1
581 76889 64700 47580 45543 83629 22668 67983   822   495   130    48     1
582 73307 64857 52431 45064 82605 23016 67685   865   484    83    49     1
583 74304 66192 49366 47097 81567 23551 67591          95   244    50     1
584 72914 66615 46323 47726 80537 24125 68952   927   -41   277    51     1
591 85438 67322 48816 47725 80934 24612 69058        -140   280    52     1
592 90548 68266 47059 46355 81262 25105 72104   951  -513   321    53     1
593 94162 67787 54621 43176 81551 25610 75270        -493   404    54     1
594 80827 67915 50057 42601 81873 25982 77947   911  -424   449    55     1
601 90124 68021 47217 42045 82277 26295 77860   967  -219   331    56     1
602 91769 68584 49142 38419 82842 26607 80468   929    37   246    57     1
603 88720 68684 43098 39516 83420 27068 81945   955   414   248    58     1
604 79799 68368 44689 40096 84000 27335 82858   928   669   225    59     1
611 73864 68584 38799 38999 83754 27642 80436   924   486   239    60     1
612 75600 69421 39504 40694 83226 28056 80716   944   549   233    61     1
613 78876 69639 44377 42863 82721 28371 80278   977   547   228    62     1
614 83121 70448 43428 43535 82241 28889 82193   964   419   260    63     1
621 89242 70526 46918 40416       29029 80527   987   382   272    64     1
622 95437 71122 49620 40500       29567 83741   968   391   273    65     1
623 95792 71092 51870 42472       29963 84869   950   375   278    66     1
624 98926 72001 53531 40866       30629 88355   986   268   287    67     1
631103883 72101 51174 40716       30924 87874   983   269   289    68     1
632105952 72800 53508 39646       31613 91564   954   138   299    69     1
633104266 72950 49607 40287       32163 93298   962    91   338    70     1
634106023 73607 47292 37774       32638 96268   969   209   352    71     1
641109266                                       990                72     1
642113199                                       981                73     1
```

APPENDIX C

PRINT-OUTS OF RESULTS OF STEP-WISE MULTIPLE REGRESSION ANALYSES OF AUTOMOTIVE SECTOR

These analyses were made through the use of a program on the University of Florida Computing Center 709 computer. The method of selection of the independent variable to be added at each step is essentially as follows: As the first step, the computer selects from the list of independent variables that "X_1" which is the most highly correlated with the dependent variable, "Y," and fits to them a simple linear equation. As a basis for the second step, each remaining independent variable is combined with X_1 and Y to determine a multiple correlation coefficient. The independent variable which provides the highest multiple correlation coefficient as a result of these trials is then selected as "X_2" in step two and a linear equation in Y, X_1, and X_2 is fitted. "X_3" is similarly selected from the remaining independent variables in step 3 and the step-wise process continues until all the independent variables which can contribute significantly to the improvement of the multiple correlation coefficient have been added. Any which cannot will not be entered. An independent variable may be removed if its contribution to the multiple correlation coefficient is reduced to a point where it is not sufficiently significant. This could occur as a result of the entry of other independent variables to which the first is highly correlated. No such cases were encountered in the use of the program for this analysis, however. In one instance, during a trial run when removal was observed, the variable removed had not contributed to the reduction of the standard error of Y. This aspect of the program's operation is not apparently consequential or in this instance relevant.

All control card entries used are standard for the program and they appear at the beginning of each of the print-outs. Header cards are used on which any comments necessary to describe the regression may be made. These appear in the output also following the control card entries. The "F" values shown in the print-outs are not those of the familiar F distribution. They are contrived levels of significance and are not relevant to this analysis.

Initially the program then provides some basic statistical results in the print-outs. "Average sum of variables" is a table of the arithmetic means of the independent and dependent variables. It should be noted that each is erroneously identified as a "sum" in the table, instead of as an "average." Following this there is a complete table of simple correlation coefficients between each pair of variables in the regression, i.e., between each two of the X or independent variables and between each of the independent variables and the dependent variable, Y.

The results of the step-wise regression are then shown. At each step the variable selected and entered in the regression is identified. The resulting standard error of estimate of Y is given, followed by the multiple correlation coefficient and the value of the constant term. Finally, at each step a list of the independent variables which have been entered, their net regression coefficients and the standard error of each coefficient is listed.[1]

---

[1] For further discussion of procedures, see University of Florida Computing Center leaflet, "Step-wise Multiple Regression with Variable Transformations: A Modification of ERMPR 3 from SHARE Distribution #1194 (Dittoed).

```
PROBLEM NO        204
NO OF DATA =   62
NO OF VARIABLES =        11
WEIGHTED DEGREES OF FREEDOM =       62.00
F LEVEL TO ENTER VARIABLE =      0.010
F LEVEL TO REMOVE VARIABLE =     0.001
*
     OPN NOT USED.
     LOG TRANSFORMATION FOR X(10).  1946-3 THRU 1961-4.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  61131.5322  SUM X( 2) =  40982.8545
     SUM X( 3) =  54841.5000  SUM X( 4) =  60925.5645
     SUM X( 5) =  17283.5967  SUM X( 6) =  51719.5000
     SUM X( 7) =      0.      SUM X( 8) =    271.8387
     SUM X( 9) =    184.9194  SUM X(10) =      3.2421
     SUM   Y   =  70026.7734

     VARIABLE   7 IS CONSTANT

                    SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.387917    X( 1) VS X( 3) =      -0.809363
     X( 1) VS X( 4) =       0.901906    X( 1) VS X( 5) =       0.977220
     X( 1) VS X( 6) =       0.954941    X( 1) VS X( 7) =      -0.
     X( 1) VS X( 8) =      -0.572335    X( 1) VS X( 9) =       0.786742
     X( 1) VS X(10) =       0.818647
     X( 2) VS X( 3) =      -0.054668    X( 2) VS X( 4) =       0.252343
     X( 2) VS X( 5) =       0.302459    X( 2) VS X( 6) =       0.263292
     X( 2) VS X( 7) =      -0.          X( 2) VS X( 8) =      -0.295036
     X( 2) VS X( 9) =       0.162270    X( 2) VS X(10) =       0.073812
     X( 3) VS X( 4) =      -0.866114    X( 3) VS X( 5) =      -0.854401
     X( 3) VS X( 6) =      -0.905823    X( 3) VS X( 7) =      -0.
     X( 3) VS X( 8) =       0.465804    X( 3) VS X( 9) =      -0.673898
     X( 3) VS X(10) =      -0.880698
```

```
      X( 4) VS X( 5) =        0.928518     X( 4) VS X( 6) =        0.971008
      X( 4) VS X( 7) =       -0.           X( 4) VS X( 8) =       -0.616341
      X( 4) VS X( 9) =        0.761721     X( 4) VS X(10) =        0.964886
      X( 5) VS X( 6) =        0.981692     X( 5) VS X( 7) =       -0.
      X( 5) VS X( 8) =       -0.518751     X( 5) VS X( 9) =        0.775328
      X( 5) VS X(10) =        0.889122
      X( 6) VS X( 7) =       -0.           X( 6) VS X( 8) =       -0.569504
      X( 6) VS X( 9) =        0.789452     X( 6) VS X(10) =        0.941408
      X( 8) VS X( 9) =       -0.774413     X( 8) VS X(10) =       -0.556121
      X( 9) VS X(10) =        0.739882
      X( 1) VS   Y   =        0.771939     X( 2) VS   Y   =        0.175856
      X( 3) VS   Y   =       -0.831292     X( 4) VS   Y   =        0.905648
      X( 5) VS   Y   =        0.786662     X( 6) VS   Y   =        0.863285
      X( 7) VS   Y   =       -0.           X( 8) VS   Y   =       -0.738674
      X( 9) VS   Y   =        0.729232     X(10) VS   Y   =        0.885215

    STANDARD ERROR OF Y = 21008.033447

  STEP NO.     1
    VARIABLE ENTERING        4
    F LEVEL      273.6996
    STANDARD ERROR OF Y       8981.9886
   MULTIPLE CORRELATION COEFFICIENT       0.90565
    CONSTANT    19886.09570
             VARIABLE    COEFFICIENT    STD  ERROR OF COEF
               X-  4         0.82298         0.04975

  STEP NO.     2
    VARIABLE ENTERING        8
    F LEVEL       24.3518
    STANDARD ERROR OF Y       7620.6246
   MULTIPLE CORRELATION COEFFICIENT       0.93420
    CONSTANT    33481.49219
             VARIABLE    COEFFICIENT    STD  ERROR OF COEF
               X-  4         0.65997         0.05360
               X-  8       -13.47788         2.73121
```

```
STEP NO.    3
  VARIABLE ENTERING       3
  F LEVEL       9.7722
  STANDARD ERROR OF Y      7110.3478
 MULTIPLE CORRELATION COEFFICIENT       0.94397
  CONSTANT   73198.36914
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -0.45792        0.14648
             X-  4        0.42650        0.08988
             X-  8      -14.87546        2.58725

STEP NO.    4
  VARIABLE ENTERING       5
  F LEVEL       13.3555
  STANDARD ERROR OF Y      6455.8859
 MULTIPLE CORRELATION COEFFICIENT       0.95486
  CONSTANT   83483.05762
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -0.58163        0.13724
             X-  4        0.72607        0.11567
             X-  5       -1.27811        0.34973
             X-  8      -13.62806        2.37378

STEP NO.    5
  VARIABLE ENTERING       9
  F LEVEL       2.5103
  STANDARD ERROR OF Y      6372.0175
 MULTIPLE CORRELATION COEFFICIENT       0.95684
  CONSTANT   87996.62305
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -0.59786        0.13585
             X-  4        0.69122        0.11627
             X-  5       -0.98325        0.39216
             X-  8      -17.17126        3.23889
             X-  9      -30.46370       19.22721
```

```
STEP NO.    6
  VARIABLE ENTERING        6
  F LEVEL        1.4582
  STANDARD ERROR OF Y        6346.1086
 MULTIPLE CORRELATION COEFFICIENT        0.95798
  CONSTANT    76399.60938
           VARIABLE   COEFFICIENT    STD  ERROR OF COEF
             X-  3        -0.42299          0.19818
             X-  4         0.48087          0.20917
             X-  5        -2.06519          0.97739
             X-  6         0.66592          0.55146
             X-  8       -17.22808          3.22606
             X-  9       -35.35049         19.57198

STEP NO.    7
  VARIABLE ENTERING        2
  F LEVEL        1.4020
  STANDARD ERROR OF Y        6323.0438
 MULTIPLE CORRELATION COEFFICIENT        0.95906
  CONSTANT    72430.14258
           VARIABLE   COEFFICIENT    STD  ERROR OF COEF
             X-  2        -0.08655          0.07309
             X-  3        -0.31936          0.21599
             X-  4         0.43004          0.21278
             X-  5        -2.02021          0.97458
             X-  6         0.79153          0.55960
             X-  8       -18.90540          3.51264
             X-  9       -45.56115         21.32246

STEP NO.    8
  VARIABLE ENTERING       10
  F LEVEL        0.0414
  STANDARD ERROR OF Y        6379.9222
 MULTIPLE CORRELATION COEFFICIENT        0.95910
  CONSTANT    70898.34375
```

```
VARIABLE    COEFFICIENT    STD  ERROR OF COEF
  X-  2       -0.07598          0.09018
  X-  3       -0.32085          0.21805
  X-  4        0.40021          0.25993
  X-  5       -1.98431          0.99904
  X-  6        0.76980          0.57464
  X-  8      -18.95310          3.55198
  X-  9      -45.55715         21.51427
  X- 10     1083.73570       5323.42578
```

```
PROBLEM NO        404
NO OF DATA =   38
NO OF VARIABLES =        11
WEIGHTED DEGREES OF FREEDOM =       38.00
F LEVEL TO ENTER VARIABLE =     0.010
F LEVEL TO REMOVE VARIABLE =    0.001
*
     OPN NOT USED.
     LOG TRANSFORMATION FOR X(10).  1952-3 THRU 1961-4.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  64815.7368  SUM X( 2) =  45740.8682
     SUM X( 3) =  46859.5259  SUM X( 4) =  76858.9209
     SUM X( 5) =  21665.2368  SUM X( 6) =  66461.3154
     SUM X( 7) =      0.      SUM X( 8) =     44.8421
     SUM X( 9) =    231.9474  SUM X(10) =      3.7633
     SUM   Y   =  83587.3418

     VARIABLE   7 IS CONSTANT

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =      -0.056217     X( 1) VS X( 3) =      -0.829140
     X( 1) VS X( 4) =       0.918689     X( 1) VS X( 5) =       0.974610
     X( 1) VS X( 6) =       0.976650     X) 1) VS X( 7) =      -0.
     X( 1) VS X( 8) =      -0.066851     X( 1) VS X( 9) =       0.651197
     X( 1) VS X(10) =       0.964672
     X( 2) VS X( 3) =       0.232067     X( 2) VS X( 4) =      -0.045705
     X( 2) VS X( 5) =      -0.020634     X( 2) VS X( 6) =      -0.079397
     X( 2) VS X( 7) =      -0.           X( 2) VS X( 8) =      -0.074770
     X( 2) VS X( 9) =       0.095748     X( 2) VS X(10) =       0.008205
     X( 3) VS X( 4) =      -0.848870     X( 3) VS X( 5) =      -0.823252
     X( 3) VS X( 6) =      -0.885481     X( 3) VS X( 7) =      -0.
     X( 3) VS X( 8) =      -0.079856     X( 3) VS X( 9) =      -0.416137
     X( 3) VS X(10) =      -0.826855
```

```
      X( 4) VS X( 5) =        0.881599    X( 4) VS X( 6) =         0.908366
      X( 4) VS X( 7) =       -0.          X( 4) VS X( 8) =        -0.036292
      X( 4) VS X( 9) =        0.536098    X( 4) VS X(10) =         0.893269
      X( 5) VS X( 6) =        0.979245    X( 5) VS X( 7) =        -0.
      X( 5) VS X( 8) =        0.085944    X( 5) VS X( 9) =         0.543189
      X( 5) VS X(10) =        0.996145
      X( 6) VS X( 7) =       -0.          X( 6) VS X( 8) =         0.048716
      X( 6) VS X( 9) =        0.584409    X( 6) VS X(10) =         0.971680
      X( 8) VS X( 9) =       -0.629363    X( 8) VS X(10) =         0.112449
      X( 9) VS X(10) =        0.514291
      X( 1) VS   Y   =        0.337308    X( 2) VS   Y   =        -0.197651
      X( 3) VS   Y   =       -0.458727    X( 4) VS   Y   =         0.382124
      X( 5) VS   Y   =        0.200411    X( 6) VS   Y   =         0.280422
      X( 7) VS   Y   =       -0.          X( 8) VS   Y   =        -0.560371
      X( 9) VS   Y   =        0.394705    X(10) VS   Y   =         0.174596

     STANDARD ERROR OF Y = 10844.403320

    STEP NO.    1
     VARIABLE ENTERING       8
     F LEVEL       16.4793
     STANDARD ERROR OF Y       9105.6810
    MULTIPLE CORRELATION COEFFICIENT       0.56037
     CONSTANT    84227.67676
             VARIABLE    COEFFICIENT    STD  ERROR OF COEF
               X-  8       -14.27978         3.51765

    STEP NO.    2
     VARIABLE ENTERING       3
     F LEVEL       20.7232
     STANDARD ERROR OF Y       7318.8976
    MULTIPLE CORRELATION COEFFICIENT       0.75441
     CONSTANT   128412.32324
             VARIABLE    COEFFICIENT    STD  ERROR OF COEF
               X-  3        -0.94193         0.20691
               X-  8       -15.31091         2.83645
```

```
STEP NO.    3
  VARIABLE ENTERING        10
  F LEVEL       10.2115
  STANDARD ERROR OF Y       6511.9653
 MULTIPLE CORRELATION COEFFICIENT       0.81771
  CONSTANT  256622.74609
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3        -1.80315          0.32638
             X-  8       -14.64084          2.53241
             X- 10   -23352.89404       7307.95697

STEP NO.    4
  VARIABLE ENTERING         1
  F LEVEL        4.4948
  STANDARD ERROR OF Y       6201.0605
 MULTIPLE CORRELATION COEFFICIENT       0.84165
  CONSTANT  197096.67188
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1         3.09577          1.46020
             X-  3        -1.62195          0.32234
             X-  8        -9.89289          3.29100
             X- 10   -63166.91895      20027.28687

STEP NO.    5
  VARIABLE ENTERING         9
  F LEVEL        8.7111
  STANDARD ERROR OF Y       5582.9824
 MULTIPLE CORRELATION COEFFICIENT       0.87794
  CONSTANT  127830.91992
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1         4.61108          1.41135
             X-  3        -1.47642          0.29437
             X-  8       -16.97670          3.81310
             X-  9       -65.06059         22.04349
             X- 10   -68577.37305      18124.05151
```

```
STEP NO.    6
  VARIABLE ENTERING        2
  F LEVEL        1.6392
  STANDARD ERROR OF Y       5528.0403
 MULTIPLE CORRELATION COEFFICIENT       0.88447
  CONSTANT  119043.21680
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1         5.32836         1.50558
             X-  2         0.28320         0.22119
             X-  3        -1.61072         0.30977
             X-  8       -16.40461         3.80192
             X-  9       -70.67583        22.26283
             X- 10    -80026.76074     20050.35767

STEP NO.    7
  VARIABLE ENTERING        5
  F LEVEL        1.5822
  STANDARD ERROR OF Y       5476.8518
 MULTIPLE CORRELATION COEFFICIENT       0.89061
  CONSTANT  306339.14453
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1         4.43113         1.65342
             X-  2         0.37866         0.23191
             X-  3        -1.72695         0.32051
             X-  5         3.88400         3.08781
             X-  8       -17.35788         3.84220
             X-  9       -75.99407        22.45826
             X- 10   -136076.46875     48787.26855

STEP NO.    8
  VARIABLE ENTERING        6
  F LEVEL        3.9262
  STANDARD ERROR OF Y       5227.8223
 MULTIPLE CORRELATION COEFFICIENT       0.90435
  CONSTANT  390564.54297
```

```
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  1        5.60469        1.68571
            X-  2        0.42609        0.22266
            X-  3       -2.39856        0.45660
            X-  5        7.12505        3.37086
            X-  6       -1.38953        0.70126
            X-  8      -14.19969        3.99887
            X-  9      -58.54357       23.17564
            X- 10  -166115.59766    48974.41895

STEP NO.     9
  VARIABLE ENTERING        4
  F LEVEL        2.3319
  STANDARD ERROR OF Y      5111.7565
 MULTIPLE CORRELATION COEFFICIENT      0.91206
  CONSTANT  638884.92188
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  1        3.53211        2.13517
            X-  2        0.44142        0.21795
            X-  3       -2.42550        0.44681
            X-  4        0.61452        0.40242
            X-  5       12.33631        4.74445
            X-  6       -1.77781        0.73132
            X-  8      -13.29016        3.95519
            X-  9      -48.11434       23.66791
            X- 10  -232602.85742    64721.55664
```

```
PROBLEM NO        004
NO OF DATA =   70
NO OF VARIABLES =        11
WEIGHTED DEGREES OF FREEDOM =        70.00
F LEVEL TO ENTER VARIABLE =      0.010
F LEVEL TO REMOVE VARIABLE =     0.001
*
     CSTA AND OPN NOT USED.
     LOG TRANSFORMATION FOR X(10).  1946-3 THRU 1963-4.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  62376.4854  SUM X( 2) =  42063.6714
     SUM X( 3) =  53183.5713  SUM X( 4) =      0.
     SUM X( 5) =  18830.1284  SUM X( 6) =  55901.5000
     SUM X( 7) =      0.      SUM X( 8) =    271.1000
     SUM X( 9) =    197.9000  SUM X(10) =      3.3529
     SUM   Y   =  73445.4424

     VARIABLE   4 IS CONSTANT
     VARIABLE   7 IS CONSTANT

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.435544    X( 1) VS X( 3) =       -0.828987
     X( 1) VS X( 4) =      -0.          X( 1) VS X( 5) =        0.984280
     X( 1) VS X( 6) =       0.965787    X( 1) VS X( 7) =       -0.
     X( 1) VS X( 8) =      -0.480561    X( 1) VS X( 9) =        0.815681
     X( 1) VS X(10) =       0.839396
     X( 2) VS X( 3) =      -0.128586    X( 2) VS X( 4) =       -0.
     X( 2) VS X( 5) =       0.366604    X( 2) VS X( 6) =        0.331411
     X( 2) VS X( 7) =      -0.          X( 2) VS X( 8) =       -0.288374
     X( 2) VS X( 9) =       0.226507    X( 2) VS X(10) =        0.149197
     X( 3) VS X( 4) =      -0.          X( 3) VS X( 5) =       -0.861344
     X( 3) VS X( 6) =      -0.911014    X( 3) VS X( 7) =       -0.
     X( 3) VS X( 8) =       0.435030    X( 3) VS X( 9) =       -0.717276
```

```
    X( 3) VS X(10) =      -0.896725
    X( 5) VS X( 6) =       0.983961    X( 5) VS X( 7) =      -0.
    X( 5) VS X( 8) =      -0.431498    X( 5) VS X( 9) =       0.805576
    X( 5) VS X(10) =       0.891196
    X( 6) VS X( 7) =      -0.          X( 6) VS X( 8) =      -0.496517
    X( 6) VS X( 9) =       0.822418    X( 6) VS X(10) =       0.941534
    X( 8) VS X( 9) =      -0.718734    X( 8) VS X(10) =      -0.516121
    X( 9) VS X(10) =       0.774335
    X( 1) VS   Y   =       0.820103    X( 2) VS   Y   =       0.250290
    X( 3) VS   Y   =      -0.853325    X( 4) VS   Y   =      -0.
    X( 5) VS   Y   =       0.830424    X( 6) VS   Y   =       0.890913
    X( 7) VS   Y   =      -0.          X( 8) VS   Y   =      -0.667999
    X( 9) VS   Y   =       0.772284    X(10) VS   Y   =       0.899750

  STANDARD ERROR OF Y = 22041.559570

STEP NO.    1
  VARIABLE ENTERING      10
  F LEVEL     289.0498
  STANDARD ERROR OF Y       9689.5242
 MULTIPLE CORRELATION COEFFICIENT      0.89975
  CONSTANT   -7153.82129
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X- 10    24038.80762     1413.92560

STEP NO.    2
  VARIABLE ENTERING       8
  F LEVEL      28.2714
  STANDARD ERROR OF Y       8186.0746
 MULTIPLE CORRELATION COEFFICIENT      0.93063
  CONSTANT     9552.66602
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  8      -14.29029        2.68762
            X- 10    20211.53467     1394.64760
```

```
STEP NO.    3
  VARIABLE ENTERING        3
  F LEVEL        8.3759
  STANDARD ERROR OF Y        7769.5709
 MULTIPLE CORRELATION COEFFICIENT        0.93870
  CONSTANT    58110.67920
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  3        -0.48085          0.16615
             X-  8       -14.83292          2.55775
             X- 10     13400.20837       2700.21616

STEP NO.    4
  VARIABLE ENTERING        6
  F LEVEL        3.1187
  STANDARD ERROR OF Y        7647.7875
 MULTIPLE CORRELATION COEFFICIENT        0.94159
  CONSTANT    50876.45703
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  3        -0.33466          0.18330
             X-  6         0.23200          0.13137
             X-  8       -14.48575          2.52533
             X- 10      9342.80188       3513.26663

STEP NO.    5
  VARIABLE ENTERING        9
  F LEVEL        5.5723
  STANDARD ERROR OF Y        7392.2095
 MULTIPLE CORRELATION COEFFICIENT        0.94640
  CONSTANT    52700.44873
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  3        -0.29190          0.17810
             X-  6         0.40751          0.14715
             X-  8       -19.19425          3.15226
             X-  9       -49.94396         21.15754
             X- 10      8522.94360       3413.57294
```

```
STEP NO.    6
  VARIABLE ENTERING        5
  F LEVEL        3.3808
  STANDARD ERROR OF Y       7258.4333
 MULTIPLE CORRELATION COEFFICIENT       0.94920
  CONSTANT   43898.94141
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3        -0.12696         0.19654
             X-  5        -1.78860         0.97275
             X-  6         1.18468         0.44668
             X-  8       -16.33251         3.46449
             X-  9       -41.51546        21.27437
             X- 10      4890.28876      3890.72949

STEP NO.    7
  VARIABLE ENTERING        2
  F LEVEL        0.9388
  STANDARD ERROR OF Y       7261.9601
 MULTIPLE CORRELATION COEFFICIENT       0.94998
  CONSTANT   44517.54395
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  2        -0.09439         0.09742
             X-  3        -0.03773         0.21714
             X-  5        -1.88775         0.97859
             X-  6         1.37871         0.48971
             X-  8       -17.82176         3.79167
             X-  9       -51.03331        23.44209
             X- 10      2478.61768      4620.35364

STEP NO.    8
  VARIABLE ENTERING        1
  F LEVEL        0.0319
  STANDARD ERROR OF Y       7319.3277
 MULTIPLE CORRELATION COEFFICIENT       0.95001
  CONSTANT   32810.46680
```

```
VARIABLE   COEFFICIENT   STD  ERROR OF COEF
  X-  1        0.22978         1.28614
  X-  2       -0.09409         0.09820
  X-  3       -0.04404         0.22169
  X-  5       -2.01991         1.23290
  X-  6        1.33537         0.54996
  X-  8      -17.52782         4.16071
  X-  9      -50.80498        23.66181
  X- 10     3219.36807      6235.12769
```

```
PROBLEM NO        504
NO OF DATA =   46
NO OF VARIABLES =         11
WEIGHTED DEGREES OF FREEDOM =        46.00
F LEVEL TO ENTER VARIABLE =     0.010
F LEVEL TO REMOVE VARIABLE =    0.001
*
     CSTA AND OPN NOT USED.
     LOG TRANSFORMATION FOR X(10).  1952-3 THRU 1963-4.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  66069.5000  SUM X( 2) =  46558.1084
     SUM X( 3) =  45724.7607  SUM X( 4) =       0.
     SUM X( 5) =  23256.6304  SUM X( 6) =  70261.4346
     SUM X( 7) =       0.     SUM X( 8) =     83.1957
     SUM X( 9) =    243.5217  SUM X(10) =      3.8413
     SUM   Y   =  86431.3037

     VARIABLE   4 IS CONSTANT
     VARIABLE   7 IS CONSTANT

                         SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.193969    X( 1) VS X( 3) =       -0.849099
     X( 1) VS X( 4) =      -0.          X( 1) VS X( 5) =        0.984986
     X( 1) VS X( 6) =       0.984434    X( 1) VS X( 7) =       -0.
     X( 1) VS X( 8) =       0.075149    X( 1) VS X( 9) =        0.674335
     X( 1) VS X(10) =       0.974985
     X( 2) VS X( 3) =       0.041821    X( 2) VS X( 4) =       -0.
     X( 2) VS X( 5) =       0.223342    X( 2) VS X( 6) =        0.176994
     X( 2) VS X( 7) =      -0.          X( 2) VS X( 8) =        0.007314
     X( 2) VS X( 9) =       0.183719    X( 2) VS X(10) =        0.221568
     X( 3) VS X( 4) =      -0.          X( 3) VS X( 5) =       -0.842128
     X( 3) VS X( 6) =      -0.884782    X( 3) VS X( 7) =       -0.
     X( 3) VS X( 8) =      -0.155456    X( 3) VS X( 9) =       -0.490306
```

```
    X( 3) VS X(10) =      -0.854388
    X( 5) VS X( 6) =       0.985748    X( 5) VS X( 7) =      -0.
    X( 5) VS X( 8) =       0.191210    X( 5) VS X( 9) =       0.594439
    X( 5) VS X(10) =       0.993652
    X( 6) VS X( 7) =      -0.          X( 6) VS X( 8) =       0.154313
    X( 6) VS X( 9) =       0.629343    X( 6) VS X(10) =       0.974970
    X( 8) VS X( 9) =      -0.524609    X( 8) VS X(10) =       0.208017
    X( 9) VS X(10) =       0.574723
    X( 1) VS   Y   =       0.565278    X( 2) VS   Y   =       0.056445
    X( 3) VS   Y   =      -0.574621    X( 4) VS   Y   =      -0.
    X( 5) VS   Y   =       0.482626    X( 6) VS   Y   =       0.535559
    X( 7) VS   Y   =      -0.          X( 8) VS   Y   =      -0.356648
    X( 9) VS   Y   =       0.486708    X(10) VS   Y   =       0.434486

  STANDARD ERROR OF Y = 11905.972412

STEP NO.    1
  VARIABLE ENTERING        3
  F LEVEL       21.6902
  STANDARD ERROR OF Y       9854.1901
 MULTIPLE CORRELATION COEFFICIENT       0.57462
  CONSTANT  139687.90820
           VARIABLE    COEFFICIENT   STD  ERROR OF COEF
             X-  3        -1.16472          0.25009

STEP NO.    2
  VARIABLE ENTERING        8
  F LEVEL       18.8079
  STANDARD ERROR OF Y       8314.2949
 MULTIPLE CORRELATION COEFFICIENT       0.73076
  CONSTANT  147411.19922
           VARIABLE    COEFFICIENT   STD  ERROR OF COEF
             X-  3        -1.30873          0.21360
             X-  8       -13.68580          3.15573
```

```
STEP NO.    3
  VARIABLE ENTERING       9
  F LEVEL       1.1520
  STANDARD ERROR OF Y      8299.6365
 MULTIPLE CORRELATION COEFFICIENT      0.73922
  CONSTANT  163492.60352
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -1.52097         0.29080
             X-  8      -16.98026         4.39827
             X-  9      -25.05997        23.34801

STEP NO.    4
  VARIABLE ENTERING       1
  F LEVEL       5.8002
  STANDARD ERROR OF Y      7862.4874
 MULTIPLE CORRELATION COEFFICIENT      0.77631
  CONSTANT   35157.82178
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        1.67973         0.69746
             X-  3       -0.86814         0.38649
             X-  8      -22.40692         4.73686
             X-  9      -74.51471        30.18093

STEP NO.    5
  VARIABLE ENTERING      10
  F LEVEL      28.9270
  STANDARD ERROR OF Y      6063.9708
 MULTIPLE CORRELATION COEFFICIENT      0.87716
  CONSTANT   18323.04688
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        7.64450         1.23260
             X-  3       -1.10785         0.30139
             X-  8      -13.85504         3.98434
             X-  9      -79.63536        23.29661
             X- 10   -95218.26172     17703.87378
```

```
STEP NO.    6
  VARIABLE ENTERING       5
  F LEVEL       8.6734
  STANDARD ERROR OF Y      5554.5532
 MULTIPLE CORRELATION COEFFICIENT      0.90076
  CONSTANT  365541.64063
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        4.22352        1.61990
             X-  3       -1.38056        0.29119
             X-  5        5.99328        2.03503
             X-  8      -17.28661        3.83112
             X-  9      -78.50123       21.34300
             X- 10  -159806.64453    27275.47656

STEP NO.    7
  VARIABLE ENTERING       2
  F LEVEL       7.6346
  STANDARD ERROR OF Y      5134.9272
 MULTIPLE CORRELATION COEFFICIENT      0.91811
  CONSTANT  365194.53125
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        4.75608        1.50987
             X-  2        0.50227        0.18178
             X-  3       -1.71188        0.29469
             X-  5        5.69190        1.88445
             X-  8      -16.83956        3.54539
             X-  9      -82.90006       19.79474
             X- 10  -168926.16602    25430.00586

STEP NO.    8
  VARIABLE ENTERING       6
  F LEVEL       4.9393
  STANDARD ERROR OF Y      4887.8217
 MULTIPLE CORRELATION COEFFICIENT      0.92813
  CONSTANT  468730.38281
```

```
VARIABLE   COEFFICIENT   STD  ERROR OF COEF
  X-  1        5.57147          1.48330
  X-  2        0.54133          0.17392
  X-  3       -2.33661          0.39712
  X-  5        9.04738          2.34459
  X-  6       -1.23955          0.55774
  X-  8      -14.49569          3.53572
  X-  9      -67.01645         20.15204
  X- 10  -201641.76563      28330.79785
```

```
PROBLEM NO        304
NO OF DATA =   25
NO OF VARIABLES =          11
WEIGHTED DEGREES OF FREEDOM =         25.00
F LEVEL TO ENTER VARIABLE =      0.010
F LEVEL TO REMOVE VARIABLE =     0.001
*
     OPN-CSTA PERIOD ONLY.  OPN IS AT T-1.  ALL OTHER VARIABLES AT T.
     LOG TRANSFORMATION FOR X(10).

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  65470.2397  SUM X( 2) =  45023.9600
     SUM X( 3) =  45507.4399  SUM X( 4) =  78268.1191
     SUM X( 5) =  22601.8799  SUM X( 6) =  68786.5596
     SUM X( 7) =    949.1600  SUM X( 8) =    139.8000
     SUM X( 9) =    228.0000  SUM X(10) =      3.8179
     SUM   Y   =  83558.2793

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =        0.018103    X( 1) VS X( 3) =        -0.826577
     X( 1) VS X( 4) =        0.894860    X( 1) VS X( 5) =         0.969415
     X( 1) VS X( 6) =        0.972496    X( 1) VS X( 7) =        -0.119637
     X( 1) VS X( 8) =       -0.064692    X( 1) VS X( 9) =         0.630476
     X( 1) VS X(10) =        0.954071
     X( 2) VS X( 3) =        0.067028    X( 2) VS X( 4) =         0.081807
     X( 2) VS X( 5) =        0.068165    X( 2) VS X( 6) =         0.000298
     X( 2) VS X( 7) =       -0.498055    X( 2) VS X( 8) =         0.021926
     X( 2) VS X( 9) =        0.029988    X( 2) VS X(10) =         0.119982
     X( 3) VS X( 4) =       -0.805556    X( 3) VS X( 5) =        -0.839483
     X( 3) VS X( 6) =       -0.891486    X( 3) VS X( 7) =         0.089970
     X( 3) VS X( 8) =       -0.081202    X( 3) VS X( 9) =        -0.402510
     X( 3) VS X(10) =       -0.829450
     X( 4) VS X( 5) =        0.863465    X( 4) VS X( 6) =         0.877958
     X( 4) VS X( 7) =       -0.214707    X( 4) VS X( 8) =        -0.061800
```

```
X( 4) VS X( 9) =       0.498987   X( 4) VS X(10) =       0.873633
X( 5) VS X( 6) =       0.980563   X( 5) VS X( 7) =      -0.251695
X( 5) VS X( 8) =       0.128906   X( 5) VS X( 9) =       0.477054
X( 5) VS X(10) =       0.995985
X( 6) VS X( 7) =      -0.155739   X( 6) VS X( 8) =       0.076764
X( 6) VS X( 9) =       0.531547   X( 6) VS X(10) =       0.968007
X( 7) VS X( 8) =      -0.373582   X( 7) VS X( 9) =       0.269329
X( 7) VS X(10) =      -0.320094
X( 8) VS X( 9) =      -0.648573   X( 8) VS X(10) =       0.160628
X( 9) VS X(10) =       0.437409
X( 1) VS   Y   =       0.286208   X( 2) VS   Y   =      -0.124920
X( 3) VS   Y   =      -0.350696   X( 4) VS   Y   =       0.295005
X( 5) VS   Y   =       0.125401   X( 6) VS   Y   =       0.213287
X( 7) VS   Y   =       0.559659   X( 8) VS   Y   =      -0.738730
X( 9) VS   Y   =       0.560346   X(10) VS   Y   =       0.084508

  STANDARD ERROR OF Y = 10344.759888

STEP NO.    1
  VARIABLE ENTERING       8
  F LEVEL      27.6298
  STANDARD ERROR OF Y       7122.3459
 MULTIPLE CORRELATION COEFFICIENT      0.73873
  CONSTANT   86068.98926
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  8      -17.95930        3.41665

STEP NO.    2
  VARIABLE ENTERING       3
  F LEVEL      13.1289
  STANDARD ERROR OF Y       5763.0808
 MULTIPLE CORRELATION COEFFICIENT      0.84587
  CONSTANT  126578.32227
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  3       -0.88766        0.24498
            X-  8      -18.77541        2.77376
```

```
STEP NO.    3
  VARIABLE ENTERING       7
  F LEVEL      13.4260
  STANDARD ERROR OF Y      4607.0499
 MULTIPLE CORRELATION COEFFICIENT      0.90910
  CONSTANT    59117.52783
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -0.93404        0.19625
             X-  7       72.82294       19.87445
             X-  8      -15.54988        2.38571

STEP NO.    4
  VARIABLE ENTERING       9
  F LEVEL       6.7040
  STANDARD ERROR OF Y      4085.4958
 MULTIPLE CORRELATION COEFFICIENT      0.93275
  CONSTANT    80810.38672
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -1.27568        0.21840
             X-  7       77.24432       17.70704
             X-  8      -21.09568        3.01059
             X-  9      -41.96146       16.20634

STEP NO.    5
  VARIABLE ENTERING       2
  F LEVEL       4.8883
  STANDARD ERROR OF Y      3738.2432
 MULTIPLE CORRELATION COEFFICIENT      0.94690
  CONSTANT    46642.31104
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  2        0.39459        0.17847
             X-  3       -1.37707        0.20503
             X-  7      101.08084       19.46121
             X-  8      -21.13447        2.75475
             X-  9      -48.99191       15.16597
```

```
STEP NO.    6
  VARIABLE ENTERING       4
  F LEVEL       0.1762
  STANDARD ERROR OF Y       3822.0179
 MULTIPLE CORRELATION COEFFICIENT       0.94743
  CONSTANT    33913.27539
           VARIABLE    COEFFICIENT    STD   ERROR OF COEF
             X-  2          0.39436          0.18247
             X-  3         -1.28773          0.29874
             X-  4          0.08096          0.19286
             X-  7        104.02198         21.09492
             X-  8        -21.08965          2.81851
             X-  9        -51.01333         16.23639

STEP NO.    7
  VARIABLE ENTERING       6
  F LEVEL       0.0839
  STANDARD ERROR OF Y       3923.1561
 MULTIPLE CORRELATION COEFFICIENT       0.94769
  CONSTANT    39863.93311
           VARIABLE    COEFFICIENT    STD   ERROR OF COEF
             X-  2          0.38573          0.18965
             X-  3         -1.35906          0.39330
             X-  4          0.11980          0.23911
             X-  6         -0.07812          0.26973
             X-  7        102.96406         21.95905
             X-  8        -20.47169          3.59473
             X-  9        -46.91010         21.87361

STEP NO.    8
  VARIABLE ENTERING       1
  F LEVEL       0.3772
  STANDARD ERROR OF Y       3997.0582
 MULTIPLE CORRELATION COEFFICIENT       0.94893
  CONSTANT    11588.65076
```

```
              VARIABLE   COEFFICIENT   STD  ERROR OF COEF
                X-  1        0.91602         1.49153
                X-  2        0.38994         0.19335
                X-  3       -1.48971         0.45368
                X-  4        0.05730         0.26402
                X-  6       -0.37706         0.55897
                X-  7      102.89576        22.37297
                X-  8      -19.86611         3.79286
                X-  9      -49.12938        22.57672

STEP NO.    9
  VARIABLE ENTERING       5
  F LEVEL       0.0407
  STANDARD ERROR OF Y      4122.5613
 MULTIPLE CORRELATION COEFFICIENT      0.94907
  CONSTANT    -2163.22241
              VARIABLE   COEFFICIENT   STD  ERROR OF COEF
                X-  1        1.22138         2.15875
                X-  2        0.39976         0.20528
                X-  3       -1.47986         0.47047
                X-  4        0.03711         0.29014
                X-  5       -0.34930         1.73243
                X-  6       -0.31141         0.66212
                X-  7      100.98118        24.95288
                X-  8      -19.66880         4.03250
                X-  9      -50.80212        24.71939
```

```
PROBLEM NO        104
NO OF DATA =   33
NO OF VARIABLES =        11
WEIGHTED DEGREES OF FREEDOM =        33.00
F LEVEL TO ENTER VARIABLE =     0.010
F LEVEL TO REMOVE VARIABLE =    0.001
*
     LOG TRANSFORMATION FOR X(10).  OPN IS AT T-1.  CSTA NOT USED.
     ALL OBSERVATIONS WHICH INCLUDE OPN.  T-1 IS 1952-4 THRU 1963-3.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  67059.2422  SUM X( 2) =  46336.9390
     SUM X( 3) =  44253.4238  SUM X( 4) =      0.
     SUM X( 5) =  24593.1211  SUM X( 6) =  73520.0000
     SUM X( 7) =    954.0303  SUM X( 8) =    170.2424
     SUM X( 9) =    245.0909  SUM X(10) =      3.9133
     SUM   Y   =  87529.6357

     VARIABLE 4 IS CONSTANT

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.316542    X( 1) VS X( 3) =       -0.854841
     X( 1) VS X( 4) =      -0.          X( 1) VS X( 5) =        0.983428
     X( 1) VS X( 6) =       0.982402    X( 1) VS X( 7) =        0.040239
     X( 1) VS X( 8) =       0.036556    X( 1) VS X( 9) =        0.692343
     X( 1) VS X(10) =       0.968634
     X( 2) VS X( 3) =      -0.149277    X( 2) VS X( 4) =       -0.
     X( 2) VS X( 5) =       0.347511    X( 2) VS X( 6) =        0.300551
     X( 2) VS X( 7) =      -0.325712    X( 2) VS X( 8) =        0.077576
     X( 2) VS X( 9) =       0.183286    X( 2) VS X(10) =        0.359678
     X( 3) VS X( 4) =      -0.          X( 3) VS X( 5) =       -0.862442
     X( 3) VS X( 6) =      -0.893115    X( 3) VS X( 7) =       -0.013219
     X( 3) VS X( 8) =      -0.128958    X( 3) VS X( 9) =       -0.513839
     X( 3) VS X(10) =      -0.863761
```

```
    X( 5) VS X( 6) =        0.986309    X( 5) VS X( 7) =        -0.054516
    X( 5) VS X( 8) =        0.175957    X( 5) VS X( 9) =         0.590195
    X( 5) VS X(10) =        0.993286
    X( 6) VS X( 7) =        0.008657    X( 6) VS X( 8) =         0.127190
    X( 6) VS X( 9) =        0.632009    X( 6) VS X(10) =         0.970490
    X( 7) VS X( 8) =       -0.321958    X( 7) VS X( 9) =         0.299838
    X( 7) VS X(10) =       -0.128950
    X( 8) VS X( 9) =       -0.541045    X( 8) VS X(10) =         0.205366
    X( 9) VS X(10) =        0.555173
    X( 1) VS   Y   =        0.590931    X( 2) VS   Y   =         0.207134
    X( 3) VS   Y   =       -0.533237    X( 4) VS   Y   =        -0.
    X( 5) VS   Y   =        0.499914    X( 6) VS   Y   =         0.557408
    X( 7) VS   Y   =        0.530319    X( 8) VS   Y   =        -0.490465
    X( 9) VS   Y   =        0.646986    X(10) VS   Y   =         0.434790

  STANDARD ERROR OF Y = 11799.297363

STEP NO.    1
  VARIABLE ENTERING       9
  F LEVEL      22.3188
  STANDARD ERROR OF Y      9140.9447
 MULTIPLE CORRELATION COEFFICIENT      0.64699
  CONSTANT   64407.96826
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  9       94.33915       19.96902

STEP NO.    2
  VARIABLE ENTERING       7
  F LEVEL       8.1570
  STANDARD ERROR OF Y      8239.1956
 MULTIPLE CORRELATION COEFFICIENT      0.73681
  CONSTANT  -22800.10962
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  7       95.56090       33.45915
             X-  9       78.18224       18.86717
```

```
STEP NO.    3
  VARIABLE ENTERING        3
  F LEVEL       7.0617
  STANDARD ERROR OF Y       7514.8821
 MULTIPLE CORRELATION COEFFICIENT       0.79523
  CONSTANT    9441.12915
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -0.87383         0.32883
             X-  7      109.72923        30.97998
             X-  9       49.26085        20.36128

STEP NO.    4
  VARIABLE ENTERING        8
F LEVEL       10.3128
  STANDARD ERROR OF Y       6538.0634
 MULTIPLE CORRELATION COEFFICIENT       0.85519
  CONSTANT   61872.48779
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  3       -1.47701         0.34223
             X-  7       98.78714        27.16757
             X-  8      -14.31503         4.45762
             X-  9       -3.21994        24.10139

STEP NO.    5
  VARIABLE ENTERING        2
  F LEVEL       16.4321
  STANDARD ERROR OF Y       5249.5602
 MULTIPLE CORRELATION COEFFICIENT       0.91268
  CONSTANT     725.00842
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  2        0.81677         0.20149
             X-  3       -1.59421         0.27630
             X-  7      135.84976        23.65211
             X-  8      -16.98372         3.63917
             X-  9      -29.40232        20.40100
```

```
STEP NO.    6
  VARIABLE ENTERING       6
  F LEVEL       8.2045
  STANDARD ERROR OF Y      4664.0517
 MULTIPLE CORRELATION COEFFICIENT      0.93437
  CONSTANT -66829.48633
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  2        0.67679        0.18557
             X-  3       -0.66176        0.40772
             X-  6        0.57219        0.19976
             X-  7      138.03803       21.02796
             X-  8      -22.66270        3.79275
             X-  9      -71.88380       23.42006

STEP NO.    7
  VARIABLE ENTERING      10
  F LEVEL       2.8427
  STANDARD ERROR OF Y      4507.0725
 MULTIPLE CORRELATION COEFFICIENT      0.94128
  CONSTANT   8521.35352
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  2        0.72021        0.18116
             X-  3       -0.67260        0.39405
             X-  6        1.07992        0.35770
             X-  7      120.54206       22.81654
             X-  8      -21.63374        3.71556
             X-  9      -70.39682       22.64898
             X- 10   -25057.69238    14862.00720

STEP NO.    8
  VARIABLE ENTERING       5
  F LEVEL       7.9651
  STANDARD ERROR OF Y      3985.8990
 MULTIPLE CORRELATION COEFFICIENT      0.95625
  CONSTANT 354090.42578
```

```
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  2         0.65900        0.16168
            X-  3        -1.33977        0.42110
            X-  5         7.33342        2.59842
            X-  6        -0.14414        0.53682
            X-  7        87.79525       23.27636
            X-  8       -21.25646        3.28863
            X-  9       -61.59150       20.27151
            X- 10  -120768.97070    36370.91602

STEP NO.    9
  VARIABLE ENTERING       1
  F LEVEL       0.5681
  STANDARD ERROR OF Y       4022.2537
 MULTIPLE CORRELATION COEFFICIENT       0.95733
  CONSTANT  306819.95313
          VARIABLE   COEFFICIENT   STD  ERROR OF COEF
            X-  1         1.29533        1.71855
            X-  2         0.66789        0.16357
            X-  3        -1.37543        0.42757
            X-  5         6.60584        2.79416
            X-  6        -0.22048        0.55110
            X-  7        82.30144       24.59357
            X-  8       -20.03612        3.69251
            X-  9       -65.52792       21.11254
            X- 10  -123049.16113    36827.11230
```

```
PROBLEM NO        014
NO OF DATA =   70
NO OF VARIABLES =         11
WEIGHTED DEGREES OF FREEDOM =        70.00
F LEVEL TO ENTER VARIABLE =      0.010
F LEVEL TO REMOVE VARIABLE =     0.001
*
     LOG TRANSFORMATION FOR X(10).  TIME IS 1946-3 THRU 1963-4.
     X IS AT TIME AND Y IS AT TIME + 1. CSTA AND OPN NOT USED.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  62376.4854  SUM X( 2) =  42063.6714
     SUM X( 3) =  53183.5713  SUM X( 4) =      0.
     SUM X( 5) =  18830.1284  SUM X( 6) =  55901.5000
     SUM X( 7) =      0.      SUM X( 8) =    271.1000
     SUM X( 9) =    197.9000  SUM X(10) =      3.3529
     SUM   Y   =  74710.4570

     VARIABLE   4 IS CONSTANT
     VARIABLE   7 IS CONSTANT

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.435544    X( 1) VS X( 3) =       -0.828987
     X( 1) VS X( 4) =      -0.          X( 1) VS X( 5) =        0.984280
     X( 1) VS X( 6) =       0.965787    X( 1) VS X( 7) =       -0.
     X( 1) VS X( 8) =      -0.480561    X( 1) VS X( 9) =        0.815681
     X( 1) VS X(10) =       0.839396
     X( 2) VS X( 3) =      -0.128586    X( 2) VS X( 4) =       -0.
     X( 2) VS X( 5) =       0.366604    X( 2) VS X( 6) =        0.331411
     X( 2) VS X( 7) =      -0.          X( 2) VS X( 8) =       -0.288374
     X( 2) VS X( 9) =       0.226507    X( 2) VS X(10) =        0.149197
     X( 3) VS X( 4) =      -0.          X( 3) VS X( 5) =       -0.861344
     X( 3) VS X( 6) =      -0.911014    X( 3) VS X( 7) =       -0.
     X( 3) VS X( 8) =       0.435030    X( 3) VS X( 9) =       -0.717276
```

```
      X( 3) VS X(10) =       -0.896725
      X( 5) VS X( 6) =        0.983961    X( 5) VS X( 7) =       -0.
      X( 5) VS X( 8) =       -0.431498    X( 5) VS X( 9) =        0.805576
      X( 5) VS X(10) =        0.891196
      X( 6) VS X( 7) =       -0.          X( 6) VS X( 8) =       -0.496517
      X( 6) VS X( 9) =        0.822418    X( 6) VS X(10) =        0.941534
      X( 8) VS X( 9) =       -0.718734    X( 8) VS X(10) =       -0.516121
      X( 9) VS X(10) =        0.774335
      X( 1) VS   Y   =        0.810166    X( 2) VS   Y   =        0.270144
      X( 3) VS   Y   =       -0.808390    X( 4) VS   Y   =       -0.
      X( 5) VS   Y   =        0.828789    X( 6) VS   Y   =        0.874398
      X( 7) VS   Y   =       -0.          X( 8) VS   Y   =       -0.611038
      X( 9) VS   Y   =        0.739606    X(10) VS   Y   =        0.890883

   STANDARD ERROR OF Y = 21505.941650

 STEP NO.    1
   VARIABLE ENTERING       10
   F LEVEL      261.5729
   STANDARD ERROR OF Y       9840.2756
  MULTIPLE CORRELATION COEFFICIENT      0.89088
   CONSTANT    -3155.18945
            VARIABLE   COEFFICIENT   STD  ERROR OF COEF
              X- 10    23223.50366     1435.92372

 STEP NO.    2
   VARIABLE ENTERING        8
   F LEVEL       11.9261
   STANDARD ERROR OF Y       9133.7998
  MULTIPLE CORRELATION COEFFICIENT      0.90821
   CONSTANT     8951.79980
            VARIABLE   COEFFICIENT   STD  ERROR OF COEF
              X-  8      -10.35600        2.99877
              X- 10    20449.92529     1556.10992
```

```
STEP NO.    3
  VARIABLE ENTERING       6
  F LEVEL        3.9344
  STANDARD ERROR OF Y       8940.1208
 MULTIPLE CORRELATION COEFFICIENT       0.91362
  CONSTANT    17771.73438
           VARIABLE    COEFFICIENT   STD  ERROR OF COEF
             X-  6         0.27178         0.13702
             X-  8       -10.14257         2.93715
             X- 10    13270.89563      3926.73398

STEP NO.    4
  VARIABLE ENTERING       9
  F LEVEL        3.8580
  STANDARD ERROR OF Y       8752.6198
 MULTIPLE CORRELATION COEFFICIENT       0.91868
  CONSTANT    23350.59326
           VARIABLE    COEFFICIENT   STD  ERROR OF COEF
             X-  6         0.43024         0.15653
             X-  8       -14.81532         3.73207
             X-  9       -48.95021        24.92137
             X- 10    12232.06616      3880.58844

STEP NO.    5
  VARIABLE ENTERING       3
  F LEVEL        0.1891
  STANDARD ERROR OF Y       8807.7301
 MULTIPLE CORRELATION COEFFICIENT       0.91893
  CONSTANT    15127.73389
           VARIABLE    COEFFICIENT   STD  ERROR OF COEF
             X-  3         0.09229         0.21220
             X-  6         0.46372         0.17532
             X-  8       -14.79414         3.75588
             X-  9       -50.06503        25.20896
             X- 10    12726.61389      4067.23169
```

```
STEP NO.    6
  VARIABLE ENTERING        1
  F LEVEL        0.0518
  STANDARD ERROR OF Y       8873.7100
 MULTIPLE CORRELATION COEFFICIENT       0.91900
  CONSTANT    1510.60645
           VARIABLE    COEFFICIENT    STD   ERROR OF COEF
             X-  1         0.28308          1.24375
             X-  3         0.06980          0.23551
             X-  6         0.34017          0.57082
             X-  8       -14.69897          3.80705
             X-  9       -50.59005         25.50234
             X- 10     13961.22644       6798.19104

STEP NO.    7
  VARIABLE ENTERING        5
  F LEVEL        0.0569
  STANDARD ERROR OF Y       8940.8849
 MULTIPLE CORRELATION COEFFICIENT       0.91907
  CONSTANT   -11119.25098
           VARIABLE    COEFFICIENT    STD   ERROR OF COEF
             X-  1         0.50899          1.57084
             X-  3         0.08490          0.24559
             X-  5        -0.35824          1.50198
             X-  6         0.39724          0.62292
             X-  8       -14.04985          4.70326
             X-  9       -49.32089         26.24058
             X- 10     14218.91211       6934.33533

STEP NO.    8
  VARIABLE ENTERING        2
  F LEVEL        0.0118
  STANDARD ERROR OF Y       9012.9999
 MULTIPLE CORRELATION COEFFICIENT       0.91909
  CONSTANT   -11355.24072
```

```
VARIABLE    COEFFICIENT    STD  ERROR OF COEF
  X-  1         0.51193         1.58375
  X-  2         0.01315         0.12093
  X-  3         0.07239         0.27298
  X-  5        -0.34613         1.51819
  X-  6         0.36967         0.67722
  X-  8       -13.83873         5.12349
  X-  9       -47.99275        29.13709
  X- 10     14564.18323      7677.91888
```

```
PROBLEM NO        005
NO OF DATA =   70
NO OF VARIABLES =          11
WEIGHTED DEGREES OF FREEDOM =        70.00
F LEVEL TO ENTER VARIABLE =      0.010
F LEVEL TO REMOVE VARIABLE =     0.001
*
     LOG TRANSFORMATION FOR X(2),(5),(6),(9),(10).
     TIME IS 1946-3 THRU 1963-4.  CSTA AND OPN NOT USED.
     NO DIFFERENCE IN TIME BETWEEN Y AND THE X VARIABLES.

               AVERAGE  VALUE  OF  VARIABLES

     SUM X( 1) =  62376.4854  SUM X( 2) =     10.5616
     SUM X( 3) =  53183.5713  SUM X( 4) =      0.
     SUM X( 5) =      9.7527  SUM X( 6) =     10.8175
     SUM X( 7) =      0.      SUM X( 8) =    271.1000
     SUM X( 9) =      5.1429  SUM X(10) =      3.3529
     SUM   Y   =  73445.4424

     VARIABLE   4 IS CONSTANT
     VARIABLE   7 IS CONSTANT

                      SIMPLE  CORRELATION  COEFFICIENTS

     X( 1) VS X( 2) =       0.457966     X( 1) VS X( 3) =       -0.828987
     X( 1) VS X( 4) =      -0.           X( 1) VS X( 5) =        0.966116
     X( 1) VS X( 6) =       0.887612     X( 1) VS X( 7) =       -0.
     X( 1) VS X( 8) =      -0.480561     X( 1) VS X( 9) =        0.763083
     X( 1) VS X(10) =       0.839396
     X( 2) VS X( 3) =      -0.240208     X( 2) VS X( 4) =       -0.
     X( 2) VS X( 5) =       0.424085     X( 2) VS X( 6) =        0.350493
     X( 2) VS X( 7) =      -0.           X( 2) VS X( 8) =       -0.334687
     X( 2) VS X( 9) =       0.166084     X( 2) VS X(10) =        0.289065
     X( 3) VS X( 4) =      -0.           X( 3) VS X( 5) =       -0.893150
     X( 3) VS X( 6) =      -0.925409     X( 3) VS X( 7) =       -0.
     X( 3) VS X( 8) =       0.435030    X( 3) VS X( 9) =       -0.767686
     X( 3) VS X(10) =      -0.896725
     X( 5) VS X( 6) =       0.969956    X( 5) VS X( 7) =       -0.
     X( 5) VS X( 8) =      -0.502362    X( 5) VS X( 9) =        0.815517
     X( 5) VS X(10) =       0.945753
     X( 6) VS X( 7) =      -0.          X( 6) VS X( 8) =       -0.538889
     X( 6) VS X( 9) =       0.852948    X( 6) VS X(10) =        0.989910
     X( 8) VS X( 9) =      -0.684325    X( 8) VS X(10) =       -0.516121
     X( 9) VS X(10) =       0.854860
     X( 1) VS   Y   =       0.820103    X( 2) VS   Y   =        0.360616
     X( 3) VS   Y   =      -0.853325    X( 4) VS   Y   =       -0.
     X( 5) VS   Y   =       0.881937    X( 6) VS   Y   =        0.920588
     X( 7) VS   Y   =      -0.          X( 8) VS   Y   =       -0.667999
     X( 9) VS   Y   =       0.821547    X(10) VS   Y   =        0.899750

  STANDARD ERROR OF Y = 22041.559570

STEP NO.    1
  VARIABLE ENTERING       6
  F LEVEL     377.8501
  STANDARD ERROR OF Y      8671.0652
 MULTIPLE CORRELATION COEFFICIENT      0.92059
  CONSTANT -347140.92578
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  6    38880.23389     2000.18016

STEP NO.    2
  VARIABLE ENTERING       8
  F LEVEL      25.1655
  STANDARD ERROR OF Y      7448.0509
 MULTIPLE CORRELATION COEFFICIENT      0.94294
  CONSTANT -284116.19922
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  6    33366.63037     2039.54347
             X-  8      -12.47287        2.48636
```

```
STEP NO.    3
  VARIABLE ENTERING       10
  F LEVEL       1.6779
  STANDARD ERROR OF Y       7410.6566
 MULTIPLE CORRELATION COEFFICIENT       0.94439
  CONSTANT -422119.65234
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  6     49209.06152    12397.66101
             X-  8       -12.00263        2.50037
             X- 10     -9991.19849     7713.26434

STEP NO.    4
  VARIABLE ENTERING        5
  F LEVEL       1.7701
  STANDARD ERROR OF Y       7367.7957
 MULTIPLE CORRELATION COEFFICIENT       0.94591
  CONSTANT -482122.07813
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  5    -12290.59229     9237.86145
             X-  6     67368.52539    18390.89746
             X-  8       -11.40446        2.52624
             X- 10    -14981.68860     8536.85559

STEP NO.    5
  VARIABLE ENTERING        1
  F LEVEL       1.8867
  STANDARD ERROR OF Y       7318.0500
 MULTIPLE CORRELATION COEFFICIENT       0.94750
  CONSTANT -229260.27734
           VARIABLE    COEFFICIENT    STD  ERROR OF COEF
             X-  1         1.65626        1.20580
             X-  5    -50050.05518    28980.82422
             X-  6     65393.46289    18323.23267
             X-  8       -10.67824        2.56428
             X- 10     -5063.90540    11136.95361
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STEP NO.    6
  VARIABLE ENTERING       9
  F LEVEL       2.4905
  STANDARD ERROR OF Y       7234.2929
 MULTIPLE CORRELATION COEFFICIENT       0.94955
  CONSTANT  -13994.63647
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        2.82061         1.40186
             X-  5   -75382.85840     32839.74023
             X-  6    61251.40723     18302.68457
             X-  8      -13.16233         2.98388
             X-  9    -6365.40332      4033.47678
             X- 10     6086.80927     13081.78906

STEP NO.    7
  VARIABLE ENTERING       3
  F LEVEL       0.1902
  STANDARD ERROR OF Y       7281.2430
 MULTIPLE CORRELATION COEFFICIENT       0.94971
  CONSTANT   47333.40283
           VARIABLE   COEFFICIENT   STD  ERROR OF COEF
             X-  1        2.84397         1.41198
             X-  3       -0.09325         0.21384
             X-  5   -74609.11523     33100.45947
             X-  6    54607.88574     23905.09863
             X-  8      -13.64674         3.20210
             X-  9    -6603.24347      4096.12830
             X- 10     8427.74438     14218.98975

STEP NO.    8
  VARIABLE ENTERING       2
  F LEVEL       0.0365
  STANDARD ERROR OF Y       7338.4881
 MULTIPLE CORRELATION COEFFICIENT       0.94974
  CONSTANT   74256.26172
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VARIABLE    COEFFICIENT    STD  ERROR OF COEF
  X-  1         2.92123          1.47943
  X-  2       516.56380       2704.14197
  X-  3        -0.11185          0.23651
  X-  5    -76735.47656      35168.73633
  X-  6     52661.14746      26159.68848
  X-  8       -13.49486          3.32377
  X-  9     -6427.57660       4229.51239
  X- 10      9812.78394      16060.53918
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BIOGRAPHICAL SKETCH

Arthur Robert Dorsch was born January 24, 1920, at Newark, New Jersey. In June, 1937, he was graduated from East Orange High School. In May, 1942, he received the degree of Bachelor of Science in Mechanical Engineering from Rutgers University. From 1942 until 1946, he served in the United States Air Force. He retired from the Reserves in 1964, with the rank of major. From 1946 to 1959, Mr. Dorsch was in industry as a mechanical engineer in the areas of research, development, and application. In June, 1958, he received the degree of Master of Business Administration from American International College. In 1959, he enrolled in the Graduate School of the University of Florida. He was awarded a University of Florida fellowship for the academic year 1959-1960, and worked as a graduate teaching assistant in the Summer Statistical Institute of 1960. During the academic year 1960-1961, he worked as a graduate assistant for the Bureau of Economic and Business Research. In 1961, he accepted an appointment to the faculty of American International College. While on leave of absence from that position in the fall of 1964, he worked as a research associate with the Bureau of Economic and Business Research and continued to pursue his work toward the degree of Doctor of Philosophy.

Arthur Robert Dorsch is married to the former Doris French French. He is a member of the American Economic Association and the American Academy of Political and Social Science and is a registered professional engineer in Connecticut.

This dissertation was prepared under the direction of the chairman of the candidate's supervisory committee and has been approved by all members of that committee. It was submitted to the Dean of the College of Business Administration and to the Graduate Council, and was approved as partial fulfillment of the requirements for the degree of Doctor of Philosophy.

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